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ENVIRONMENTAL REVIEW OF "CERTAIN INDUSTRIES"

AS DEFINED IN THE SCHOOL ZONE PROTECTIVE ORDINANCE

RUTHERFORD COUNTY, NORTH CAROLINA

Volume 1 of 3

Prepared for
Rutherford County

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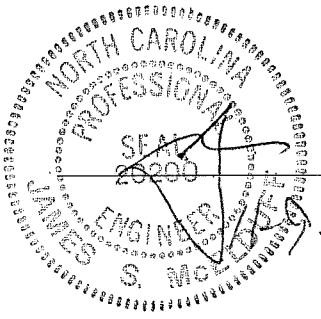

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TABLE OF CONTENTS

Section **Page**

EXECUTIVE SUMMARY ..... **III**

1.0 INTRODUCTION **1**

2.0 BACKGROUND **3**

3.0 METHODS **5**

3.1 Regulatory Applications 5
3.1.1 DENR Division of Air Quality 5
3.1.2 DENR Division of Land Resources 7
3.1.3 U.S. Army Corps of Engineers 7
3.1.4 DENR Division of Water Quality – Aquifer Protection Section 8
3.1.5 DENR Division of Water Quality – Surface Water Protection Section 9
3.1.6 DENR Division of Environmental Health – Public Water Supply 11
3.1.7 Rutherford County Watershed Ordinance 11

3.2 Compliance History 11
3.2.1 Applicants 12
3.2.2 Industries in Region 15

3.3 Current Industry Siting Considerations in Applicable Settings 17
3.3.1 Air Quality 17
3.3.2 Water Quality 18
3.3.3 Land Use 18

4.0 FINDINGS **19**

4.1 Regulatory Applications 19
4.1.1 DENR Division of Air Quality 19
4.1.2 DENR Division of Land Resources – Land Quality Section 28
4.1.3 U.S. Army Corps of Engineers 32
4.1.4 DENR Division of Water Quality – Aquifer Protection Section 33
4.1.5 DENR Division of Water Quality – Surface Water Protection Section 35
4.1.6 DENR Division of Environmental Health – Public Water Supply 36
4.1.7 Rutherford County Watershed Ordinance 37

4.2 Compliance History 37
4.2.1 Applicants 37
4.2.2 Industries in Region 41

4.3 Current Industry Siting Considerations in Applicable Settings 44
Air Quality 44

4.3.1 Water Quality 50

5.0 CONCLUSIONS 58

6.0 RECOMMENDATIONS 60

7.0 REFERENCES 64

FIGURES

1. Proposed Henrietta Quarry
2. Watershed Areas and School Locations
3. School Locations with 2000 Foot Radii
4. Watershed Area

TABLES

1. Air Quality Violations
2. Industry Separation Ordinances
3. Riparian Buffers

APPENDICES

A. Ordinances
B. Permits
C. Correspondence
D. Scientific Data
E. Regulations

EXECUTIVE SUMMARY

Rutherford County has enacted two ordinances that influence where heavy industries may be located. These ordinances include a School Zone Protective Ordinance and a Watershed Protection Ordinance. The School Zone Protective ordinance includes a list of "certain industries" and states that they may not be located within 2,000 feet of public and charter schools. The Watershed Protection Ordinance includes a requirement for 30-foot buffers along perennial streams in "Protected Areas." It also requires that "No activity, situation, structure or land use shall be allowed within the watershed which poses a threat to water quality and the public health, safety and welfare."

In response to public concern that these provisions are inadequate, the Board of Commissioners enacted a moratorium on "high impact" polluting industries within the County's watershed districts. The moratorium cited concerns related to industries such as quarries and asphalt plants, and the adverse effects these industries have on water quality and quantity, and the health and safety of citizens.

This study was undertaken so that the County could consider information regarding the effects a group of these industries has on water quality and water tables, and whether buffers should be required to protect the public. The group includes Asphalt Plants, Concrete Plants, Quarrying, and Sand Pits. Additional industry groups would be defined and reviewed based on the methods established in this report.

Long Branch Partners, LLC (Long Branch) and APAC – Atlantic, Inc. (APAC – Atlantic) are considering development of an industrial facility in the County. Plans for the proposed facility include a quarry and an asphalt plant. In addition, a concrete mixing plant may be constructed within the facility in the future. Construction of the facility is proposed on a property near the community of Henrietta.

The County instructed Altamont Environmental, Inc. to conduct an independent third-party review and make any recommendations "based on sound scientific basis for a proper protective separation distance." Altamont conducted research aimed at identifying applicable scientific studies. In addition, Altamont used publicly available information from local government units in North Carolina and outside the state, to catalogue the ways in which other communities protect public health and water quality while providing sites for heavy industries.

Long Branch and APAC – Atlantic have submitted applications to the North Carolina Department of Environmental Resources (DENR) and the US Army Corps of Engineers (USACE) for permits that are necessary to construct the proposed facilities. These applications include those for mining, erosion and sedimentation control, discharge of air, discharge of stormwater, construction in navigable streams, and building in a protected watershed.

The applications are currently being reviewed at the USACE and in several divisions of the DENR. The DENR has requested additional information from the applicants. While these reviews have been underway, the County has received information from the Blue Ridge Environmental Defense League (BREDL) and concerned residents. In their documents, BREDL and others have questioned the health effects of asphalt manufacturing on nearby residents. Altamont reviewed all of the available information

submitted by the applicants and others; as well as the requests for additional information made by the regulatory agencies.

In summary, the applications indicate that the proposed facilities will operate entirely within the guidelines established by the regulatory agencies. However, the DENR has requested substantial additional information, suggesting that their concerns, which are expressed in numerous letters and memoranda, have not yet been allayed. Many comments provided by DENR and guidance documents prepared by groups such as the US Environmental Protection Agency, illustrate the unresolved technical debates that accompany siting these industries.

So that the County may evaluate the potential environmental effects of this group of heavy industries, Altamont interviewed environmental regulators in the region and obtained their files on APAC – Atlantic and Long Branch Partners, where the two applicants have operations at other locations. Likewise, Altamont reviewed similar operations owned by different companies. Review of these documents found that operations at asphalt plants, concrete plants, and quarries receive Notices of Violation from the DENR. Most of these violations are related to emissions of dust. However, pollutants in fuel oil and odors have also been the cause of some violations. DENR reported that typically, only continuous complaints from the public trigger a violation related to odor, and because of the nature of the violation and the potentially "arbitrary and capricious" nature of the regulation, it is rarely enforced. Similarly, surface water quality violations are rarely cited. However, some regulators related the low number of water quality violations to the transient nature of the environmental conditions that cause the violations and the small number of numerical limits applied to surface water quality.

The sources referenced in this report did not include a single study based on air samples collected in residential or commercial areas near the focus group of heavy industries. Although the existing data are clear in describing the health-effects of pollutants emitted by quarries, asphalt plants, and concrete plants, existing studies base their conclusions on samples collected within the plants or on data from laboratory studies of toxicity. Whereas many of these studies have been used to understand the health-risks to workers in these industries, they have not been used to reliably predict exposures outside the facility boundaries.

Land use planning mechanisms are commonly in use throughout the United States. Altamont obtained information from planning departments in approximately 40 towns, cities, and counties in North Carolina and from several local governments or planning agencies outside the state. Two planning tools are most prevalent in all of the contacted areas: zoning and stand-alone ordinances. With respect to polluting industries, zoning tends to cluster similar uses by district. Stand-alone ordinances, such as the "Polluting Industries Ordinances" used in some North Carolina counties, establish siting criteria and treat the industries as "Special" or "Conditional" uses. These ordinances characteristically allow polluting industries in all parts of a county, although separated by setbacks from incompatible uses.

Comparison of the stand-alone ordinances to zoning ordinances shows that zoning results in shorter setbacks. Zoning setbacks reviewed extend from 10 to 200 feet. Those established by stand-alone ordinances extend from 500 to 2,640 feet. The Blue Ridge Environmental Defense League (BREDL) recommended a 3,000-foot setback from high impact land uses. This recommendation was based on reports of noxious odors. A more in-depth basis was not provided.

In summary, there is an absence of scientific studies with clear conclusions regarding setbacks. Likewise, there is no unanimity expressed in the wide range of setbacks used by local governments. As a result, there is no equitable basis on which Altamont can recommend fixed setbacks using existing information.

Consequently, Altamont considered three options for recommendation to Rutherford County. The options provide three courses the County may take in maintaining current or establishing new setbacks.

Option 1 - Maintain the Status Quo
Keep the School Zone Protective and Watershed Protection Ordinances in place unaltered.

Option 2 - Establish Setbacks Based on Scientific Methods
Establish setbacks from heavy industries and protected streams on the basis of accepted scientific methods.

Option 3 - Establish Setbacks Based on Current Land Use
Establish setbacks using actual Rutherford County land use information.

Altamont Recommendation:
Option 3 - Establish Setbacks Based on Current Land Use
Keep current ordinances in place while using County staff, supplemented by appropriately qualified technical consultants, to establish setbacks that would maximize the desired protections, while providing continued siting opportunities for necessary industries.

1.0 INTRODUCTION

Rutherford County enacted a School Zone Protective Ordinance on October 1, 2001 (Appendix A). The ordinance included a list of "certain industries" and states that they may not be located within 2,000 feet of public and charter schools.

In response to public concern that these provisions are inadequate, the Rutherford County Board of Commissioners enacted a moratorium on "high impact" polluting industries within the County's watershed districts. The moratorium was enacted on October 21, 2005 and terminates December 21, 2005. The moratorium cited concerns related to industries such as quarries and asphalt plants, and the adverse effects these industries have on water quality and quantity, and the health and safety of citizens.

The County enacted the moratorium so that it could consider new information from governmental agencies regarding two items:

- The effects these industries have on water quality and water tables in the watershed; and
- Whether buffers should be required to protect the public.

The moratorium was applied to "certain industries," as defined in the School Zone Protective Ordinance, and watershed districts. The moratorium stated the County's intent to retain a consultant to advise it on the environmental impact of such industries and the health and safety of the citizens.

By highlighting watersheds and water quality, the moratorium references the County Watershed Protection Ordinance, which was enacted on May 15, 1997 (Appendix A). The watershed ordinance includes the two following provisions for protection of water supplies:

- Buffers which must be installed near perennial streams and
- The requirement that "No activity, situation, structure or land use shall be allowed within the watershed which poses a threat to water quality and the public health, safety and welfare."

The County retained Altamont Environmental, Inc. (Altamont) to complete a comprehensive environmental review of "certain industries," as defined in the School Zone Protective Ordinance. The review was conducted within the context established by federal, state, and local regulations; including the two referenced County ordinances. This report of the environmental review includes the associated Methods, Findings, Conclusions, and Recommendations.

2.0 BACKGROUND

Prior to the start of this project, Altamont recommended that the County categorize industries identified in the School Zone Protective Ordinance into compatible groups, and complete a separate review of each group. This report presents the review of the first such group. Additional groups would be defined and reviewed based on the template established in this report. In response to these recommendations, the County instructed Altamont to evaluate the following industries:

- Asphalt Plants
- Concrete Plants
- Quarrying
- Sand Pits

Long Branch (Long Branch) and APAC – Atlantic, Inc. (APAC – Atlantic) are considering development of an industrial facility in Rutherford County. Plans for the proposed facility include a quarry and an asphalt plant. In addition, a concrete mixing plant may be constructed within the facility in the future. Construction of the facility is proposed on a property near the community of Henrietta.

The proposed location, which is shown on Figure 1, is within a protected watershed. More broadly, Rutherford County Geographical Information System (GIS) website shows that three protected watersheds are located in the County. The locations of these watersheds are depicted on Figure 2.

Likewise, 21 schools are located in the County. The locations of these facilities and the surrounding 2,000-foot protective zones are shown in Figure 2. The proposed locations of the asphalt plant, quarry and nearby schools are shown in Figure 3. The location of the proposed quarry, with respect to the watershed in which it is located, is shown in Figure 4.

In establishing the basis for this environmental review, the County instructed Altamont to conduct an independent third-party review and make any recommendations "based on sound scientific basis for a proper protective separation distance;" focusing the review on the protected watershed and water quality

issues. In response, Altamont conducted research aimed at identifying applicable scientific studies. In addition, Altamont used publicly available information from local government units in North Carolina and outside the state, to catalogue the ways in which other communities protect public health while providing sites for heavy industries.

3.0 METHODS

In response to requests made by the County, Altamont conducted an evaluation of the identified industrial facilities based on the following factors:

- ***Review regulatory applications that have been submitted for the project.***
  Review applicable information provided by the County and the project file maintained by the North Carolina Department of Environment and Natural Resources (DENR) in the Asheville Regional Office (ARO).
- ***Review and summarize the compliance history of the applicants.***
  Review documents submitted by the public to Rutherford County, as well as historic compliance records in the DENR regional office. Altamont would also interview appropriate DENR personnel for additional information.
- ***Summarize current enforcement in other applicable settings.***
  Research similar industrial land use practices to evaluate the scientific bases used in other communities engaged in the siting of similar facilities. This research would include other North Carolina communities and states with potential more restrictive standards.
- ***Make recommendations to the County.***
  Prepare a report for the County summarizing the methods, findings, conclusions, and recommendations. Altamont recommended expanding the report from watershed and surface water quality issues to all applicable environmental media; including air, surface water, and groundwater.

3.1 REGULATORY APPLICATIONS

Altamont contacted several regulatory agencies to obtain information and applications related to the proposed quarry and asphalt plant. Various agencies have enforcement authority in a variety of environmental media. These media include air, soil, groundwater, stormwater, and surface water. The following sections outline the contacts made by Altamont. Section 4.1 discusses information obtained from these sources.

3.1.1 DENR Division of Air Quality

The North Carolina Department of Environment and Natural Resources (DENR) Division of Air Quality (DAQ) has enforcement authority in Rutherford County. Altamont requested a file review at the DENR Asheville Regional Office on October 27, 2005 for APAC – Atlantic Henrietta Facility and Long Branch. The following documents were provided by DENR staff in the Air Quality Section:

APAC – Atlantic - Henrietta Facility

- **July 5, 2005** – Report titled *Modeling Analysis, APAC – Atlantic, Inc., Proposed Henrietta Facility*, prepared by Pisgah Environmental Services on behalf of APAC – Atlantic, Inc. (Appendix B)
- **July 12, 2005** – Letter from DENR to APAC – Atlantic, Inc. regarding receipt of air permit application (Appendix C)
- **July 28, 2005** – DENR DAQ Memorandum from Tom Anderson, Meteorologist, DENR DAQ Air Quality Analysis Branch (AQAB) through Jim Roller, Supervisor, DENR DAQ AQAB to Christopher Scott, Environmental Engineer, DENR DAQ ARO regarding Dispersion Modeling Analysis (Appendix C)
- **August 5, 2005:** Completed DENR DAQ Application forms from APAC – Atlantic, Inc. to DENR DAQ ARO (Appendix B)
- **October 6, 2005:** E-mail from Paul Muller, Supervisor with DENR DAQ ARO to Danny Searcy Rutherford County Planner regarding zoning consistency determination (Appendix C)
- **October 13, 2005:** E-mail message from Paul Muller, Supervisor with DENR DAQ ARO to Greg Davis, APAC – Atlantic, Inc. regarding zoning consistency determination (Appendix C)

Long Branch

Based upon an October 27, 2005 review at the DENR Asheville Regional Office the following documentation was available:

- **May 12, 2005** – E-mail from Patrick Ballard with DENR to Dan March, formerly with Brooks and Medlock, PLLC, (Brooks and Medlock) regarding a proposed quarry somewhere in southwest North Carolina (Appendix C)
- **June 27, 2005** – Air permit application package for the Henrietta Quarry from Long Branch to DENR DAQ (Appendix B)
- **July 5, 2005** – Letter from Mr. Tom Anderson with the DENR DAQ AQAB to Long Branch requesting inclusion of the proposed APAC-Atlantic, Inc. facility's emissions in dispersion modeling presented for the proposed Henrietta Quarry (Appendix C)
- **July 18, 2005** – Letter from the DENR DAQ to Long Branch regarding the receipt of the air permit application requesting additional information. (Appendix C)
- **July 28, 2005** – Additional air permit application data, as requested by DENR DAQ, from Brooks and Medlock, submitted on behalf of Long Branch. (Appendix B)

- **August 8, 2005** – Letter and attachments from HRP Associates, Inc. on behalf of Long Branch including a revised air quality model that included proposed emissions for the APAC-Atlantic facility. (Appendix B)
- **September 12, 2005** – Letter and attachments from HRP Associates, Inc. on behalf of Long Branch including a second revision to the combined "facility-wide" air quality model. (Appendix B)

3.1.2 DENR Division of Land Resources

The DENR Division of Land Resources (DLR), Land Quality Section (LQ), has enforcement authority over two issues relevant to the proposed project: Mining and Erosion and Sediment Control. Applicants for mining permits and related operations are required to submit Erosion and Sediment Control plans with the Mining Permit application. The Mining Program disseminates relevant portions of the application to the responsible regulatory group.

To review the mining permit application, Altamont obtained the following documents from DENR staff in the Land Quality Section:

- **July 5, 2005:** Plans and a New Mining Permit Application for the Henrietta Quarry (Appendix B)
- **Various Dates:** Review comments from the following agencies:
    - DENR Division of Water Resources - Water Allocation Section
    - DENR Division of Land Resources - Land Quality Section - Asheville Regional Office
    - DENR Division of Air Quality - Asheville Regional Office
    - DENR - Division of Parks and Recreation
    - North Carolina Wildlife Resources Commission
    - U.S. Fish and Wildlife Service - Asheville Field Office

3.1.3 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) has authority to regulate construction, excavation, or deposition of materials in, over, or under the waters of the United States; or any work, which would affect the course, location, condition, or capacity of those waters. This authority is established through Section 404 of the Clean Water Act of 1972 and the Rivers and Harbors Acts of 1890 and 1899.

Altamont conducted an initial review of the USACE file for this project using resources available online (www.saw.usace.army.mil/wetlands/Notices/2005/o532568.pdf) (Appendix B). This search found that a Public Notice was issued by the Wilmington District Corps of Engineers for an application submitted by Long Branch. The proposed asphalt and concrete plants were included in the project area plans, thus a separate permit application was not on file for APAC-Atlantic. Altamont submitted a Freedom of Information Act request (FOIA) on October 27, 2005 for the project application and related documents concerning the proposed Henrietta Quarry and Hot Mix Asphalt Plant. (Appendix C)

3.1.4 DENR Division of Water Quality – Aquifer Protection Section

Groundwater Quality

The Safe Drinking Water Act (SDWA) requires the development of a state wellhead protection program. This North Carolina Wellhead Protection Program is part of a national groundwater protection strategy to prevent contamination of groundwater that is used as public drinking water supplies. Although local Wellhead Protection Plans are not mandatory, DENR views them as valuable supplements to existing state groundwater protection programs. North Carolina's program is intended for city and county governments and water supply operators who wish to provide added protection to their local groundwater supplies. The Wellhead Protection Plan, once implemented, reduces (but does not eliminate) the susceptibility of wells to contaminants. Altamont reviewed the Wellhead Protection Program database to establish the presence of wellhead protection areas in Rutherford County (Appendix D).

North Carolina's regulations for groundwater protection are contained in 15A NCAC 2L (Appendix E). These regulations establish classifications for all groundwater resources and establish groundwater quality standards. These rules protect groundwater for use as drinking water. The Aquifer Protection Section of the Division of Water Quality administers a program to prevent pollution from wastes that are discharged to groundwater. The Aquifer Protection Section is responsible for reviewing and recommending permit conditions and limitations for many activities that potentially threaten groundwater. Many of these activities are permitted by other state agencies. In addition to those permits, the Aquifer Protection Section reviews various other plans and projects submitted to the State for compliance with groundwater standards to suggest appropriate pollution management practices.

Altamont interviewed personnel in the Aquifer Protection Section to determine whether there are any relevant issues.

Groundwater Quantity

The Division of Water Resources Water Allocation Section provides technical and management support for the development and use of groundwater resources in the State of North Carolina. On October 27, 2005, Altamont reviewed a memorandum sent by Ms. Kristen McSwain, of the Water Allocation Section, to Brenda Harris, of the DENR Mining Program (which is within the Division of Land Resources), regarding the mining permit application for Long Branch Partners – Henrietta Quarry (Appendix C).

On November 1, 2005, Altamont received and reviewed a copy of an "Assessment of Hydrogeologic Impacts on Neighboring Water Supplies" conducted by Charles H. Gardner (Appendix C). The report was prepared to address comments in the North Carolina Department of Environment and Natural Resources; Division of Land Resources dated August 12, 2005 related to the mining application, more specifically item number five of the letter.

3.1.5 DENR Division of Water Quality – Surface Water Protection Section

Stormwater

Industrial facilities planning point-source discharges of stormwater to the surface waters of the State of North Carolina must register with the DWQ prior to beginning such discharges. Registration is completed by filing a Notice of Intent (NOI). (***Note:*** The DENR DWQ Surface Water Protection Section was formerly known as the Water Quality Section.)

In North Carolina, the DWQ issues general National Pollutant Discharge Elimination System (NPDES) permits for stormwater discharge in several industrial categories. Once a facility submits a NOI to discharge under a general permit, the DWQ provides a Certificate of Coverage referencing one of the general permits.

Altamont interviewed three DENR staff members with responsibility for stormwater management: Ms. Janet Cantwell and Ms. Aisha Lau, both in the Asheville Regional Office; and Mr. Ken Pickle, in the Raleigh Central Office. A database search by Ms. Cantwell identified no permit was on record for the

proposed APAC-Atlantic Henrietta Hot Mix Asphalt Plant. Asphalt plants are required to submit a NPDES application for coverage under General Permit NCG160000 (Appendix B). If approved for a Certificate of Coverage, requirements of the permit include:

- Stormwater Pollution Prevention Plan
- Annual Analytical Monitoring
- Semi-Annual Qualitative Monitoring
- On-site Vehicle Maintenance Monitoring

Mining activities that discharge wastewater derived by dewatering mined materials are required to submit a NOI to discharge under General Permit NCG020000 (Appendix B). Submittal of this application is required under the provisions of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by the North Carolina Environmental Management Commission, and the Federal Water Pollution Control Act.

General Permit NCG020000 covers mining and quarrying of nonmetallic minerals (except fuels), including borrow pits that would not be covered under the statewide Department of Transportation stormwater permit, and active or inactive mines that discharge stormwater. It also covers discharge of wastewater from the processing of mined materials and mine dewatering wastewater from the groundwater and/or stormwater that accumulates in the mine pit.

Also as part of the requirements, the mine dewatering activities that have the potential to drain wetlands must have secured and implemented an Operation and Monitoring Plan approved by the Division of Water Quality. As of October 31, 2005, there was no NPDES permit on file for Long Branch. Ms. Lau, an Environmental Engineer with DWQ, stated that a NPDES permit is typically not issued for proposed quarries until the Division of Land Quality approves the mining application.

Surface Water

In accordance with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States, an Individual 401 Water Quality Certification is required for an applicant proposing to discharge into

navigable waters (Appendix E). Altamont obtained the applicable permit; a 401 Water Quality Certification issued by DWQ to Mr. Steve Whitmire of Long Branch (Project # 20051409)(Appendix B). Altamont interviewed Mr. Kevin Barnett regarding the document and its terms. Mr. Barnett is an environmental chemist with the DWQ in the Asheville Regional Office.

Based on the air discharge permit application and a process flow diagram provided in the same document, APAC-Atlantic will not discharge water into navigable waters. As a result, there is no 401 permit application for APAC-Atlantic.

3.1.6 DENR Division of Environmental Health – Public Water Supply

The DENR Division of Environmental Health (DEH) - Public Water Supply Section regulates public water supply under the provisions of 15A NCAC 18C (Appendix E). The function of the Public Water Supply Section is to protect the water supply of North Carolina by providing norms and procedures to assure that the water is safe for human consumption. If an industry is going to be established in an area, approval by the DEH may be required. Altamont interviewed Mr. Wade Knox with the North Carolina DENR Public Water Supply Section on October 26, 2005 to determine if any permit applications were on file for APAC or Long Branch.

In addition, the rules regulate the minimum horizontal separation between wells and known potential sources of pollution. The rules are to be consulted prior to establishing an industry in the area.

3.1.7 Rutherford County Watershed Ordinance

Rutherford County Building Inspections and Planning Department requires submittal of a Rutherford County Application for Watershed Permit. Altamont obtained the application for a Watershed Permit submitted by Long Branch Partners on September 20, 2005 for the proposed Henrietta quarry (Appendix B).

3.2 Compliance History

Information in this section is organized by "Applicants" and "Industries in the Region." Altamont obtained information from several agency groups to develop an understanding of the compliance history of Long Branch Partners, APAC – Atlantic, and similar industries on file with the DENR. Additionally,

on October 28, 2005, Rutherford County provided Altamont a compliance review prepared by the Blue Ridge Environmental Defense League (BREDL). Altamont incorporated information provided by BREDL into its review of agency documents.

The compliance review is not intended to be exhaustive. Instead, the review was conducted in a manner that should provide an overall indication of the compliance history of each company.

3.2.1 Applicants

3.2.1.1 APAC - Atlantic

DENR Division of Air Quality

During the file review at the DENR Asheville Regional Office on October 27, 2005, the DAQ files were reviewed to obtain information related to APAC - Atlantic facilities in the region. Altamont utilized information from the North Carolina Secretary of State website to establish previous legal names of APAC – Atlantic, Inc (Appendix C). These names included APAC - Carolina, Inc. and North Carolina Bitulithic, Inc. Using these names, Notices of Violation (NOVs) for the following APAC facilities were obtained and reviewed:

- 2990 Clear Creek Road; Hendersonville, North Carolina 28792-8515
- 1964 West US Highway 19 E; Burnsville, North Carolina 28714
- 180 Causby Road, Morganton; North Carolina 28655-7216
- 1920 Maple Creek Road; Rutherfordton, North Carolina 28139

BREDL provided a compilation of NOVs and complaints to Rutherford County. The County transmitted this information to Altamont. Altamont used the information during file review at the DAQ.

Additionally, DAQ files were reviewed for APAC-Carolina, Inc. operations in Transylvania, Henderson, Yancey, Burke, and Rutherford counties on October 27, 2005 at the Asheville Regional Office. A summary of air quality violations for these facilities is provided in Table 1.

DENR Division of Land Resources – Land Quality Section

Division of Land Resources files were reviewed for APAC-Carolina, Inc. operations in Transylvania, Henderson, and Rutherford counties on October 27, 2005 at the DENR Asheville Regional Office.

U.S. Corps of Engineers

Altamont submitted a FOIA request on October 26, 2005 for files related to APAC-Atlantic, under the inspection and enforcement authority of the Asheville Regulatory Field Office (Appendix C). These files have not yet been made available to Altamont.

DENR Division of Water Quality – Aquifer Protection Section

Altamont interviewed Mr. Qu Qi of the Aquifer Protection Section on October 27, 2005. Mr. Qi was interviewed to determine whether APAC – Atlantic is the responsible party for any groundwater incidents on file.

DENR Division of Water Quality – Surface Water Protection Section

Stormwater

Ms. Janet Cantwell of the DWQ Asheville Regional office was interviewed regarding past NPDES stormwater discharge violations by APAC-Atlantic.

Surface Water

Mr. Kevin Barnett of the DWQ Asheville Regional office was interviewed regarding past violations of 401 Water Quality Certification requirements by APAC-Atlantic.

Mr. Larry Frost, an Environmental Chemist with the Division of Water Quality Asheville Regional office, was interviewed November 4, 2005 concerning water quality standards violations by APAC-Atlantic.

3.2.1.2 Long Branch Partners

DENR Division of Air Quality & Georgia DNR EPD Air Protection Branch

The corporation completing the application to the Division of Air Quality, Long Branch, does not have an air quality permit on file in the Asheville Regional Office of DENR. Therefore, the corporation named Long Branch does not have a compliance history available for review.

However, based upon information provided by the BREDL, Long Branch operated a quarry in Dahlonega, Georgia. Altamont contacted the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources (DNR), Air Protection Branch, to obtain available information regarding compliance with air quality.

DENR Division of Land Resources – Land Quality Section & Georgia DNR

According to Mr. Chris Scott of DENR, Long Branch has no facilities in North Carolina.

Altamont searched the Georgia DNR database for previous enforcement orders since June 15, 1998. The search returned only a water quality violation dated March 22, 1999. The DNR database includes previous violations regarding the state of Georgia Air Quality Act, Solid Waste Management Act, Erosion and Sedimentation Control Act, Groundwater Use Act, Oil or Hazardous Materials Spill or Release Act, Safe Drinking Water Act, Surface Mining Act, Water Quality Control Act, and Water Well Standards Act, among others.

U.S. Corps of Engineers

Altamont submitted a FOIA request on October 26, 2005 for Long Branch Partners related files under the inspection and enforcement authority of the Asheville Regulatory Field Office (Appendix C). These files have not yet been made available to Altamont.

DENR Division of Water Quality – Aquifer Protection Section

Altamont contacted Mr. Qu Qi to determine if Long Branch is named as the responsible party for any groundwater incidents. (***Note:*** Present North Carolina regulations do not establish a limit on the quantity

of water to be removed from an aquifer as result of dewatering; therefore, further research on this issue was not pursued with DENR.)

DENR Division of Water Quality – Surface Water Protection Section & Georgia DNR EPD

Stormwater

No stormwater discharge violations were listed for Long Branch Partners under the authority of the DWQ Asheville Regional Office.

The Georgia EPD was contacted on October 26, 2005, and the Georgia EPD Enforcement Order database was consulted for records of enforcement orders relating to the Long Branch Quarry operated by Long Branch in Lumpkin County, Georgia.

Surface Water

Mr. Kevin Barnett of the DWQ Asheville Regional office was interviewed regarding past violations by Long Branch Partners of 401 Water Quality Certification requirements.

Mr. Larry Frost, an Environmental Chemist with the Division of Water Quality Asheville Regional office, was interviewed November 4, 2005 concerning water quality standards violations by Long Branch.

3.2.2 Industries in Region

DENR Division of Air Quality

On November 1, 2005, Mr. Paul Muller, regional supervisor of the DENR DAQ Asheville Regional Office, was contacted to document his experience with typical air quality violations associated with asphalt plants, concrete plants, quarries, and sand pits. Additionally, Altamont reviewed a document titled *A Report on APAC – Atlantic Asphalt Plants in North Carolina*; September 23, 2005; prepared by the BREDL (Appendix D).

DENR Division of Land Resources – Land Quality Section

Civil penalties for violations in regards to mining permits were reviewed for the state of North Carolina from 2000 to 2005 on the DENR Land Quality Section website. Additionally, Charles Koontz was

interviewed on October 27, 2005 regarding NOVs issued in regards to land quality issues for the past 12 years at the Penrose Quarry.

U.S. Corps of Engineers

Nancy Wallace and Steve Chapin of the Asheville Regulatory Field Office were interviewed on October 27 and 31, respectively, about compliance issues relating to asphalt plants, concrete plants, quarries, and sand pits.

DENR Division of Water Quality – Aquifer Protection Section

Groundwater Quality

Altamont, interviewed Mr. Qu Qi with the Aquifer Protection Section on October 26, 2005 regarding compliance issues with quarries and asphalt plants.

Groundwater Quantity

Altamont interviewed Mr. Qu Qi, of the Aquifer Protection Section, on October 26, 2005. Mr. Qi stated that groundwater issues for mines are handled by the Mining Program within the Division of Land Resources. He suggested contacting Mr. Mike Goodson of the Land Quality Section and Mr. Nat Wilson of the Division of Water Resources. These individuals were contacted on November 2, 2005.

DENR Division of Water Quality – Surface Water Protection Section

Stormwater

Ms. Janet Cantwell of the DWQ Asheville Regional Office and Ken Pickle of the DWQ Stormwater Permitting Unit were interviewed about compliance issues relating to asphalt plants, concrete plants, quarries, and sand pits.

Surface Water

Mr. Kevin Barnett and Mr. Larry Frost of the DWQ Asheville Regional office were interviewed regarding surface water compliance issues related to asphalt plants, concrete plants, quarries, and sand pits.

3.3 CURRENT INDUSTRY SITING CONSIDERATIONS IN APPLICABLE SETTINGS

3.3.1 Air Quality

Toxic Air Pollutants

Emissions of toxic air pollutants are estimated using the emission factors contained in US EPA AP-42 or information from source-specific emission tests or continuous emission monitors. For proposed facilities the AP-42 emission factors are used to estimate the mass rate of pollutants that are being emitted from a process (e.g., pounds per day) (Appendix D).

Emission factors are specific to activities and sources. They work by relating the quantity of a pollutant released to the atmosphere with a unit weight, volume, distance, or duration of an activity emitting the pollutant. The factors are averages of available data and are assumed to be representative of long-term averages for all facilities of that type.

The emission factors in combination with proposed facility characteristics, such as capacity in tons per hour, result in the mass of pollutant emitted from that source (e.g., pounds of benzene per hour emitted from the plant). Typically, pollutant mass emission rates are estimated for a proposed facility and the emission rates are submitted to DENR.

DENR compares the toxic pollutant emissions to the toxic pollutant exemption rates (TPERs) contained in 15A NCAC 2Q .0711 (Appendix E). If the TPERs are exceeded then DENR will request that a facility demonstrate, through air quality modeling, that facility wide emissions of toxic air pollutants from a proposed facility do not exceed acceptable ambient levels (AALs) contained in 15A NCAC 2D .1100. If the AALs are exceeded then modifications to a proposed facility would need to be made or the proposed facility location may not be feasible.

Criteria Pollutants

EPA has established six "criteria pollutants." DENR DAQ has adopted standards for these "criteria pollutants" for use as indicators of air quality. Associated with each "criteria pollutant" is a maximum

ambient air concentration above which adverse effects on human health may occur. These maximum ambient air concentrations are set forth in 15A NCAC 2D .0400.

As with toxic pollutants, US EPA AP-42 has emission factors for "criteria pollutants" based upon the type of operation occurring. The emission factors are used to estimate the mass rate of "criteria pollutants" emitted from a source activity based upon the proposed facility characteristics.

Similarly, "criteria pollutant" emission rates are estimated for a proposed facility and the emission rates are submitted to DENR. DENR may request that a facility demonstrate, through air quality modeling, that facility wide emissions of "criteria pollutants" from a proposed facility do not exceed AALs contained in 15A NCAC 2D .0400. If the "criteria pollutant" AALs are exceeded then modifications to a proposed facility would need to be made or the proposed facility location may not be feasible.

3.3.2 Water Quality

The Rutherford County Watershed Protection Ordinance as well as applicable federal and state regulations were reviewed to determine their requirements pertaining to the siting of industrial facilities based on water quality considerations. In addition, Altamont consulted scientific articles regarding the affects of asphalt plants, concrete plants, quarries, and sand pits on water quality.

3.3.3 Land Use

Altamont researched similar industrial land use practices to evaluate the restrictions employed in other communities engaged in the siting of similar facilities. This research included other North Carolina communities and states with potentially more restrictive standards.

Research into these practices was based on two methods: online searches and telephone interviews. Altamont reviewed online information or interviewed personnel engaged in planning at the local government level in approximately 40 towns, cities, or counties.

4.0 FINDINGS

4.1 REGULATORY APPLICATIONS

Altamont reviewed applications and related information provided by several regulatory agencies to obtain information and applications related to the proposed quarry and asphalt plant. The following sections are organized according to the agency that provided specific documents.

4.1.1 DENR Division of Air Quality

Section 3.1.1 lists documents that were provided by DENR. The following paragraphs discuss information contained in those documents.

4.1.1.1 APAC – Atlantic, Inc.- Henrietta Facility

The *Modeling Analysis*, prepared by Pisgah Environmental Services, was dated July 5, 2005. It included an introduction, area description, pollutant characteristics, modeling analysis, and modeling results.

Introduction

The introduction summarizes the facility characteristics. The proposed plant will consist of continuous mix double barrel drum fired by a 98.6 million British Thermal Unit (Btu) per hour burner. The proposed facility will produce a maximum of 300,000 tons of asphalt per year at a rate of 300 tons per hour. Aggregate to be used in asphalt production will be dried in an aggregate drier. Emissions from the proposed aggregate drier will be controlled by a fabric filter baghouse. APAC – Atlantic, Inc. proposes a storage silo for asphalt awaiting transfer into trucks. Emissions from the proposed silo and truck loading will not have a control device. In addition, APAC-Atlantic proposes a lime silo that has a bin vent that emits during filling. However, the Modeling Analysis states that the lime silo does not contribute toxic air pollutants.

The DENR Division of Air Quality has prepared a Microsoft Excel spreadsheet for estimating emissions from hot mix asphalt plants similar to the one proposed by APAC – Atlantic. The DENR spreadsheet utilizes asphalt plant parameters (e.g., hours of operation, production capacity, etc.) established by the applicant and emissions factors and calculations from the US EPA document AP 42, Fifth Edition;

Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources; Chapter 11.1, *Hot Mix Asphalt Plants*; Final Edition; December 2000; Update 2001. The assumptions included in the spreadsheet are summarized in the Spreadsheet Description provided in Appendix D. Based on the results from the spreadsheet calculations, operation of the proposed facility will result in toxic air pollutant emissions in excess of the Toxic Pollutant Emission Rate (TPER) limits set forth in 15A NCAC 2Q .0711 for the following compounds:

- Formaldehyde
- Mercury and Compounds
- Nickel and Compounds
- Arsenic and Compounds
- Benzene

Based on the rates at which these compounds would be emitted, DENR requires that the applicant prepare a dispersion model for air quality.

Area Description

This section describes the geographic location of the proposed facility. The land upon which the proposed facility will be located is owned by Long Branch. If constructed as currently proposed, the location would include an adjacent quarry and hot mix asphalt plant. The quarry would supply aggregate to the asphalt plant. Based upon a land use typing analysis, the area within three kilometers (about 9,800 feet) of the facility is described as rural. Pisgah Environmental Services cited a 1978 reference establishing the land use type.

The air quality application states that an "environmental easement" has been granted to APAC - Atlantic. Altamont interviewed Mr. Dan March on November 1, 2005 to obtain additional information on an "environmental easement." Mr. March stated that the easement is a "letter or memorandum of understanding between APAC – Atlantic and Long Branch, in which APAC accepts responsibility for environmental activities associated with their operation" within the Long Branch Quarry.

Pollutant Characteristics

Pollutant emission rates are based upon the DENR spreadsheet calculations. The emission rates of the compounds were compared to the rates defined under Title 15A, North Carolina Administrative Code (NCAC), Subchapter 2Q, Section .0711. The calculated emission rates are compared to threshold criteria from the regulations, in the following table.

Table A – Comparison of Emission Rates to Threshold Criteria

Compound Description	Calculated Emission Rates	Rates Requiring a Permit
Formaldehyde	0.956 pounds per hour	0.04 pounds per hour
Mercury and Compounds	0.0187 pounds per day	0.013 pounds per day
Nickel and Compounds	0.454 pounds per day	0.13 pounds per day
Arsenic and Compounds	0.168 pounds per year	0.016 pounds per year
Benzene	119 pounds per year	8.1 Pounds per year

The calculated emission rates listed above were annualized for benzene and arsenic and compounds based upon the proposed annual operating hours and the number of hours in one year. In other words, APAC-Atlantic, Inc. divided the emission rates for these two compounds by 8,760 hours per year and multiplied them by 2,500 hours per year to reflect the proposed operating hours. Annualizing the emission rates for benzene and arsenic and compounds lowers the hourly emission rates (during operating hours) by 71 percent.

However, information in the application indicates that the plant will be operated ten hours per day, five days per week. Annualizing the emission rates distributes discharge of the pollutants over a 24-hour period; thus over reporting emissions for some periods, and under reporting for other periods.

Modeling Analysis

APAC-Atlantic, Inc. utilized US EPA's SCREEN3 numerical analysis model to determine if the emission rates for the toxic air pollutants in Table 1 may cause or contribute to any significant ambient air concentration that may adversely affect human health beyond the adjacent property boundary. The

DENR defines Acceptable Ambient Levels (AALs) as concentrations, above which, adverse human health affects may occur. These AALs are defined in 15A NCAC 02D .1104.

The modeling considered three sources:

- Dryer Stack – ES-1
- Silo Loading – ES-2, and
- Truck Loadout – ES-3

Modeling input parameters for each source were specified. Modeling input parameters included such factors as stack height, stack shape, surface elevation, flow rate of the gas exiting the stack, gas temperature, and distance to the nearest property boundary. The modeling analysis notes that the release height (i.e. stack height) of pollutants is the primary factor in dispersion.

The US EPA model utilizes meteorological data that are intended to identify "worst case" meteorological conditions. For each emission source, identified in the permit application as ES-1, 2, and 3, the distances and elevations of potential receptors were estimated based upon the shortest distance to the property line and the elevation at incremental horizontal distances from the property line, outward 5,000 meters (about 16,000 feet). In addition, specific distances to receptors at critical heights were determined and two other specific analyses, "cavity analysis" and "inversion breakup fumigation analysis" were investigated by the model used by APAC-Atlantic.

Modeling Results

The results of the modeling indicated that off-site impacts of the compounds in Table 1 were less than the AALs. The estimated maximum ambient concentrations in micrograms per cubic meter ($\mu g/m^3$) at 77 degrees Fahrenheit and 29.92 inches of mercury pressure were as follows:

- Formaldehyde – 13.4 $\mu g/m^3$ (8.9% of the AAL)
- Mercury and Compounds – 9.6×10^{-5} $\mu g/m^3$ (0.016% of the AAL)
- Nickel and Compounds – 1.98×10^{-3} $\mu g/m^3$ (0.033% of the AAL)

- Arsenic and Compounds – 1.59×10^{-5} µg/m³ (6.9% of the AAL)
- Benzene – 9.66×10^{-2} µg/m³ (80.5% of the AAL)

Following receipt of the *Modeling Analysis* by DENR, correspondence occurred between APAC – Atlantic, DENR and Rutherford County regarding air quality permitting and analysis. This correspondence is summarized in the following paragraphs.

The July 12, 2005 letter from DENR to APAC-Atlantic, Inc. states that the air permit application (i.e., *APAC-Atlantic, Inc. Modeling Analysis*) was received. The letter states that the application did not contain the local zoning consistency determination and the professional engineer (P.E.) registration seal.

The July 28, 2005 memorandum from Tom Anderson states that the Air Quality Analysis Branch (AQAB) reviewed the permit application's dispersion modeling and the modeling adequately demonstrates compliance on a source-by-source basis, for all toxics modeled. The AQAB further states the proposed plant would be permitted to produce 300,000 tons of asphalt per year with a maximum production rate of 300 tons per hour.

The air permit application forms containing the necessary P.E. registration seal were received by DENR on August 4, 2005.

The October 6, 2005 e-mail from Mr. Paul Muller, of DENR, to Mr. Danny Searcy, with Rutherford County, states that the zoning consistency determination statute instructs the DENR DAQ to proceed with processing the air permit application if a local zoning consistency determination is not received from the County within 15 days of a request by the applicant. The e-mail further states that a local zoning consistency determination will be accepted by DENR at any time during the permitting process prior permit issuance.

The October 13, 2005 e-mail from Paul Muller to Greg Davis, with APAC-Atlantic, states that the County's local zoning consistency determination has not been received by DENR. In the e-mail, DENR

requests documentation to verify the applicant's request was received by the County. Documentation in the form of a Federal Express proof-of-delivery statement was received by DENR on October 17, 2005.

4.1.1.2 Long Branch

A May 12, 2005 e-mail from Mr. Patrick Ballard, with DENR, to Mr. Dan March (formerly with Brooks and Medlock and currently with Pisgah Environmental Services), states the following:

- A single quarry-wide air permit application could be submitted if all operations (e.g., rock crushing, asphalt production, concrete production) are all under common control.
- Operations may be divided into individual permits if they are not under common control.
- The permit application will require air modeling analyses for particulate matter and toxic air pollutants for the entire site (i.e., all operations).
- A public notice and/or public hearing would most likely include the entire site.
- The quarry application must include an equipment list and flow diagram

Long Branch submitted an air discharge permit application to DENR DAQ June 27, 2005 for the Henrietta Quarry. The package contained the following components:

- Cover letter summarizing the proposed facility and operation
- Facility process and flow diagrams for quarrying operations
- Maps and figures indicating the facility location
- DENR permit application forms (prepared by Brooks and Medlock)
- Calculations for air emission sources in the quarry; calculations were submitted with and without air emission control devices (prepared by Brooks and Medlock), and
- Particulate matter dispersion modeling analysis (prepared by HRP Associates, Inc.)

The cover letter describes two processes that will be conducted by the applicant. The first process, quarrying, is described as loosening rock by drilling, freeing rock into transportable fragments through blasting, and transporting rock with heavy equipment to stone-crushing operations. Stone crushing operations consist of refining quarried rock into useful products through crushing, screening, size classification, material handling, and storage.

The cover letter also describes a proposed construction schedule, a completed request to Rutherford County for a local zoning consistency determination, an enclosed air permit application fee, and a completed public notice (e.g., signs placed at the proposed facility location and a local newspaper add in the Forest City Daily Courier).

The facility process flow diagram and air permit application followed the cover letter. The DENR permit application forms have the necessary P.E. registration seal. The forms indicate that one source of emissions will be associated with all operations. The source is identified as ES-1. Proposed emissions from ES-1 consist of total particulate matter less than 100 micrometers in diameter (TSP) and total particulate matter less than ten micrometers in diameter (PM-10). The emissions from the proposed operations are based on emission factors from US EPA's AP 42, Fifth Edition *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Chapter 11.19.2 *Crushed Stone Processing and Pulverized Mineral Processing*; dated August 2004. The following processes will contribute to emissions from ES-1:

- Crusher operations,
- Screening operations, and
- Conveyors

The emissions from many of these processes, as described in the permit application, would be controlled. Emissions controls consist primarily of wet suppression systems (e.g., nozzles that spray water on the crushed rock). Potential emission estimates for ES-1 are based upon the rated capacity of the proposed equipment that will be used in the facility operations (e.g., 750 tons per hour for the "JAW" crusher). Actual emission estimates are based upon anticipated annual throughput (e.g., 1 million tons per year for the "JAW" crusher).

The following actual and potential emissions for ES-1 are included in the application:

- Potential TSP emissions without controls – 783.76 tons per year
- Actual TSP emissions with controls – 10.91 tons per year

- Potential PM-10 emissions without controls – 281.02 tons per year
- Actual PM-10 emission with controls – 4.03 tons per year

A dispersion modeling analysis was submitted with the air permit application. HRP Associates, Inc. (HRP), of Greenville, South Carolina, prepared the dispersion modeling analysis. The purpose of the analysis was to demonstrate to the DENR DAQ, that the proposed quarrying operations will result in compliance with the National Ambient Air Quality Standards (NAAQS) and DENR DAQ ambient air quality standards for particulate matter.

The dispersion modeling analysis provides a characterization of the site. The geographic location of the site is provided and the site topography is described as sharply rolling with natural terrain variations approaching 150 feet. The area within three kilometers (about 9,800 feet) of the facility is described as rural.

The analysis describes the source of the emissions. The specified operating hours for the proposed facility are ten hours per day. The maximum proposed facility capacity is 800 tons of crushed stone per hour. The processes contributing to the emissions are the same as those indicated on the air permit application. The dispersion modeling analysis also includes particulate emissions due to travel by heavy equipment within the facility along unpaved roads and those due to wind erosion associated with stockpiled stone. The emission factors for dust from roads and stockpiles are from the *Air Pollution Engineering Manual,* edited by Wayne T. Davis, copyright 2000.

The analysis provides locations for each process contributing to emissions. For example, a northing and easting in North Carolina state plane meters and an estimated elevation of 24.4 meters below the current ground elevation reflects the location and depth of emissions in the proposed quarry pit.

The analysis provides emission rates for TSP and PM-10 that would occur if all of the proposed permitted activities and processes operate simultaneously at maximum design capacity. This represents a "worst case" scenario.

The analysis provides particle size and distribution. The particle size and distribution were specified by DENR in the form of particle densities and particle diameters.

The source, location, emission rates, and pollutant types were used as input parameters in the dispersion model. HRP utilized US EPA's Industrial Source Complex Short Term – 3 (ISCST3) dispersion model to estimate the ambient air concentrations that would be created by the facility. The model uses input parameters described in this section and meteorological data provided by US EPA and DENR. The meteorological data used in the model for the proposed Henrietta facility consisted of National Weather Service station data from 1987 through 1991 for the following locations:

- Surface observation data – Charlotte, North Carolina
- Concurrent upper-air data – Greensboro, North Carolina

The results of this model indicate proposed ambient concentrations below the following North Carolina standards.

- TSP
  - 75 micrograms per cubic meter ($\mu g/m^3$) annual geometric mean, and
  - 150 $\mu g/m^3$ maximum 24-hour concentration, not to be exceeded more than once per year.
- PM-10
  - 150 $\mu g/m^3$, 24-hour average concentration; and
  - 50 $\mu g/m^3$, annual arithmetic mean.

On July 5, 2005, Mr. Tom Anderson, of the DENR DAQ, responded to the dispersion modeling presented for the proposed Henrietta Quarry. The DAQ made three requests to the applicant. Two of the requests were reflected in the June 27, 2005 version of the model submitted to DENR. The revisions were based on an earlier telephone conversation between the model developer and the DAQ. The third request was not reflected in the model. The third request asked for inclusion of the proposed APAC-Atlantic hot mix asphalt facility's TSP and PM-10 emissions in the proposed Henrietta Quarry's TSP and PM-10 emissions.

On July 18, 2005, the DENR DAQ issued a letter to Long Branch regarding the receipt of the air permit application. The letter states that the wrong fee was submitted, two additional copies of the permit application were required, and the local zoning consistency determination was incomplete.

On July 28, 2005, Brooks and Medlock submitted three items: the requested local zoning consistency determination, the additional copies of the permit application, and a check in the correct amount for the permit application fee.

On August 8, 2005, HRP submitted a revised air quality model. This revision included the proposed APAC-Atlantic hot mix asphalt facility's TSP and PM-10 emissions. The revised model indicated ambient air concentrations below the DENR DAQ standards, but the referenced APAC-Atlantic particulate emissions for TSP and PM-10 did not equal the TSP and PM-10 emissions provided in the air permit application forms submitted by APAC-Atlantic on August 4, 2005.

On September 12, 2005 HRP submitted a second revision to the TSP and PM-10 combined "facility-wide" air permitting modeling. The revision included changes to the TSP and PM-10 emission rates reported by HRP in their August 8, 2005 revision. The new rates more closely matched those reported by APAC Atlantic on August 4, 2005.

The results of the September 12, 2005 modeling analysis indicate proposed ambient air concentrations below the TSP and PM-10 North Carolina standards. Based on a conversation between Tom Anderson and Altamont on October 28, 2005, the DENR is still awaiting a detailed site plan from Long Branch indicating the locations of the proposed activities that were included in ambient air quality modeling.

4.1.2 DENR Division of Land Resources – Land Quality Section

As stated in Section 3.1.2, the DENR Land Quality Section, has enforcement authority over two issues relevant to the proposed project: Mining and Erosion and Sediment Control. In accordance with the Mining Act of 1971, a standard erosion and sedimentation control plan is not required for mining operations. Instead, erosion and sedimentation control measures are reviewed as part of the Mining Permit application.

Altamont reviewed plans entitled "Application for a New Mining Permit for the Henrietta Quarry," dated July 5, 2005, and follow up comments dated August 12, 2005 from the Land Quality Section.

The Land Quality Section comments indicate that several items in the application were incomplete or inadequate. The section has requested submittal of additional information. As of November 8, 2005, the Land Quality Section had not received a response.

The following items were among those requested by the Land Quality Section:

- Threatened and endangered species study
- Wetland delineation approved by USACE
- Permits and certifications from USACE and DWQ
- Detailed blasting study
- Thorough ground water well survey for used and unused wells within 500 foot radius
- Copies of signed return receipts from 27 adjacent landowners
- Erosion and sedimentation control measures for asphalt and concrete plants
- Design information for the freshwater ponds onsite
- Additionally, the Land Quality Section noted that the sediment basins should be sized to accept flow from contributing sediment basins.

The comments from DENR included requests for the design calculations of the proposed fresh water ponds. DENR was of the opinion that sediment-laden water could be deposited during initial construction activities, if the traps were left unchanged.

Altamont observed that the mining permit application covers the operations of the mine through three phases of activity. However, the associated engineering drawings only account for land disturbances during Phase I, which is expected to occur during years one through three. The engineered drawings do not give an indication of the actions that will be taken to prevent erosion and sedimentation in Phases II and III. The latter two phases will include quarrying streambed locations and mitigation of the disturbed

portions of the stream. Moreover, erosion and sedimentation control measures were not given for either the proposed asphalt plant or concrete plant.

U.S. Fish and Wildlife Service (USFWS) comments provided by the Land Quality Section include several "concerns" about the project. One such concern was the impact to the thousands of feet of streams that will be excavated as part of the quarrying process (e.g., pit excavation, dam construction and inundation, and road crossings). The USFWS stated that these impacts appear to impede on areas where undisturbed buffers should be maintained. Specifically, the applicant stated that "...sometime between years three and five, we will begin implementing stream diversions in order to allow the removal of rock from an existing stream bed." The USFWS commented that the buffers listed in the mining application seem to only affect portions of stream in which mining is not proposed.

The USFWS also stated that a USACE permit will be required in order to disturb the given reaches of streams. The USFWS stated that it will request denial of the USACE permit unless Long Branch can demonstrate that "all wetland and stream impacts are necessary and that unavoidable impacts are properly and completely mitigated."

USFWS requested a survey of threatened and endangered species in areas where suitable habitat exists. A biologist from the USFWS visited the proposed site on August 2, 2005 and found that the federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) was present onsite and not accounted for in the mining permit application.

Non-native grass species are proposed for vegetation in the erosion and sedimentation control plan. The USFWS stated its belief that intrusion of exotic species contributes to the endangered or threatened status of more than 40 percent of the federally listed species. While this is the opinion of the USFWS, these non-native grass species are included in the DENR *Erosion and Sediment Planning and Design Manual*; dated September 1, 1988.

The North Carolina Wildlife Resources Commission (NCWRC) returned comments dated July 27, 2005. The NCWRC commented that details and plans regarding the diversion of creek for mining within and

near its former channel were not included with the mine permit application. The NCWRC requested a formal wetland delineation and comprehensive mitigation plan. NCWRC indicated that it expects a mitigation plan with additional information regarding the potential effects of the mine on fish and wildlife resources. NCWRC also expects additional information on the proposed ground cover and details regarding "unavoidable impacts."

The NCWRC noted that some of the specifies species for ground cover (e.g., fescue and Sericea lespedeza) are not suitable. While NCWRC hold the opinion that these species are not suitable, both are included in the DENR *Erosion and Sediment Planning and Design Manual*; dated September 1, 1988.

Furthermore, the NCWRC expressed concerns regarding potential sedimentation of downstream waters and recommended that sediment and erosion control measures adhere to the design standards for sensitive watersheds (15A NCAC 4B .0124). Even though the NCWRC recommends use of these standards, this section of Subchapter 4B was written for use in High Quality Waters (HQW). Altamont researched these design standards and found that the NCWRC, by reference, has made the following recommendation:

> *"Uncovered areas in HWQ zones shall be limited at any time to a maximum total area within the boundaries of the tract of 20 acres."*

The Division of Water Resources (DWR) reviewed the mine permit application and, in an internal memorandum from Ms. Kristen McSwain (Water Allocation Section) to Brenda Harris (Mining Program) on July 28, 2005, requested an inventory of water supply wells, both used and unused, within a 500 foot radius of the property line.

In the memorandum, DWR stated that Long Branch may conduct a hydrogeologic analysis of the area surrounding the proposed quarry site if they opt not to provide the adjacent well users with connections to a community water system. Additionally, DWR requested an estimate of the pumping rate or pumping schedule for all dewatering operations. DWR further noted that registration is required with the DWR for any withdrawal of 100,000 gallons per day or more. The comments contained in the DWR

memorandum were incorporated into Item 5 of the August 12, 2005 Land Quality Section letter to Long Branch. The Land Quality Section requirements are discussed in Section 4.1.4, ***Groundwater Quantity***.

4.1.3 U.S. Army Corps of Engineers

In response to a request made to the USACE for information on the proposed Long Branch/APAC project, Ms. Angie Pennock, of the USACE, reported to Altamont on October 27, 2005 that the Wilmington office determines whether the Asheville field office can respond to such a request. Ms. Pennock said that determination could require "a few weeks." Once that approval is granted, she said, the Asheville field office will copy the file.

The Wilmington District Corps of Engineers issued a Public Notice regarding the Long Branch's application for the quarry on August 10, 2005. The comment deadline expired September 9, 2005. Since the application has not been provided, Altamont has not verified that all adjacent property owners are listed. Mr. Steve Chapin, of the USACE Asheville Regulatory Office, stated that the USACE contacts adjacent property owners listed by the applicant. The Public Notice obtained from the Wilmington District website provided a description of the work proposed by Long Branch. The stated purpose of the project is to develop a hard rock quarry which would require relocation of streams to excavate a quarry pit, construction of four water reservoirs for processing rock, and piping of streams to construct roads.

Prior to issuing a permit, the Public Notice states that the USACE will require submittal of a final stream impact mitigation plan. In addition, consultation under Section 7 of the Endangered Species Act of 1973 (ESA) is required since the project may affect a federally listed (Threatened) species, the dwarf-flowered heartleaf (*Hexastylis naniflora*). (***Note:*** The presence of this species was also noted by the USFWS; see Section 4.1.2) According to the Public Notice, the USACE bases the decision on whether to issue a permit on an evaluation of probable and cumulative impacts of the proposed activity on the public interest, including concern for protection and utilization of resources. As of October 31, 2005, the USACE had not received any further documentation from the applicant regarding the Henrietta Quarry.

4.1.4 DENR Division of Water Quality – Aquifer Protection Section

Groundwater Quality

Review of the Wellhead Protection Program indicated that there is only one wellhead protection plan approved in Rutherford County. The wellhead protection area is in Chimney Rock, which is some 60 miles northwest of the subject site. Therefore, wellhead protection regulations do not apply. A copy of a portion of the Wellhead Protection Program database is included in Appendix D.

In addition, the review showed that three transient non-community public water supply sources are located in the vicinity of the project. A transient non-community public water supply source is defined as a public water system that serve 25 or more people at least 60 days per year. However, based on location, the subject site will likely have no adverse effect on the transient non-community public water supply sources. A copy of a map showing the wellhead protection areas and public water supply sources is included in Appendix D.

Groundwater Quantity

In a memorandum from Ms. Kristen McSwain (Water Allocation Section) to Brenda Harris (Mining Program) dated July 28, 2005, Ms. McSwain stated that, based on the information provided by Long Branch, the Water Allocation Section was not able to determine the extent of impact to the groundwater water supply in the area of the proposed quarry. Ms. McSwain requested additional information and studies on the impact of the dewatering process on the groundwater supply. Her comments were incorporated into Item 5 of an August 12, 2005 letter from the Land Quality Section to Long Branch.

On October 31, 2005, Altamont received an "Assessment of Hydrogeologic Impacts on Neighboring Water Supplies" prepared by Charles H. Gardner, PE, PG. Mr. Gardner is a consultant working on behalf of Long Branch. The assessment was conducted in response to comments from the Land Quality Section dated August 12, 2005.

The Land Quality Section requested either a groundwater well survey or a hydrogeologic analysis. Long Branch opted to perform the hydrogeologic analysis. According to the Land Quality Section, the analysis must, at a minimum, include the following elements:

- A geologic map with fracture trace/lineament analysis
- Groundwater level map of the wells in the area
- Topographic map with GPS verified well locations
- Suggestions for a groundwater monitoring plan

The analysis provided by Mr. Gardner, included the following elements:

- A groundwater well survey. The survey included a tabulation of properties indicating the water supply for each and a map of relevant property boundaries. (***Note:*** The submittal provided to Altamont did not include either the tabulation or the map.)
- A description and investigation of site hydrogeology. This description appears to be based on soil types as identified in a typical US Department of Agriculture Soil Survey and a map prepared by the US Geological Survey (USGS). The analysis stated that this map was attached. However, Altamont did not receive any attachments or maps. The investigation was based on Mr. Gardner's experience in Piedmont quarries and information collected from the following sources:
    - Six exploratory rock cores,
    - Inspection of USGS topographical quadrangle maps of lineaments within five miles of the site,
    - Inspection of rock outcrops
    - Results of a pumping test conducted 2.5 miles from the proposed quarry site
- An assessment of impact to neighboring wells. The assessment was based on Mr. Gardner's experience at similar quarries. He stated that the quarry would, in his opinion, have no impact on neighboring wells. However, Mr. Gardner stated that Long Branch "intends to provide city water to any neighbor whose well is harmed by the quarry."
- A groundwater monitoring plan. The monitoring plan includes suggestions for monitoring well locations, depths, construction, and frequency of measurement. Mr. Gardner recommended metering the pumping rate at the quarry and installing a rain gauge. A map with monitoring plan details was not provided to Altamont.

The Land Quality Section requested either a groundwater well survey or a hydrogeologic analysis. The consultant working for Long Branch stated that he had prepared the analysis. However, many of the elements he submitted were those for the well survey. Of the four requested elements, Altamont received only suggestions for a groundwater monitoring plan.

4.1.5 DENR Division of Water Quality – Surface Water Protection Section

Stormwater

No stormwater discharge permit was on record for APAC-Atlantic or Long Branch Partners for the proposed Henrietta site.

Surface Water

The DWQ issued a 401 Water Quality Certification No. 3531 to Long Branch. The certification approves the following stream impacts:

- 5,496 feet of stream impacts
- 0.396 acres of 404/CAMA wetlands impacts

Conditions of the certification require erosion and sediment control practices in accordance with the *North Carolina Sediment and Erosion Control Planning and Design Manual* and the *North Carolina Surface Mining Manual*. In addition all construction activities are required to be performed so that no violations of state water quality standards occur.

Several additional items must be submitted by Long Branch to DWQ. A final stream relocation and/or stabilization plan is required before any of the authorized impacts can occur. The stream mitigation plan is required to include a minimum of 1:1 restoration for all impacts to perennial stream. In addition, a final stormwater management plan, appropriate for the surface water classification of the project area, is required for the project area. The plan must be designed to remove at least 85 percent of the Total Suspended Solids (TSS).

Surface Water Classifications are designations applied to surface water bodies, such as streams, that define the best uses to be protected within these waters. Four streams are located in the project area - Hogpen Branch and three unnamed tributaries to Hogpen Branch. The DWQ has classified Hogpen Branch as Class WS-IV Waters. WS-IV waters are generally in *moderately to highly developed* watersheds, or Protected Areas Waters used as sources of potable water where a WS-I, II or III classification is not feasible. Class WS-IV waters are also protected for Class C uses. These include

secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, and agriculture (15A NCAC 02B .0211). According to 15A NCAC 02B.0216, Fresh Surface Water Quality Standards for WS-IV Waters, a minimum 100 foot vegetative buffer is required for all new development that exceeds 24 percent built upon density, otherwise a minimum of a 30 foot vegetative buffer for development shall be required along all perennial waters. The Henrietta Quarry plans estimated a 2.2 percent built upon density and thus a minimum 30-foot buffer is required.

4.1.6 DENR Division of Environmental Health – Public Water Supply

Altamont interviewed Mr. Wade Knox with the North Carolina DENR Public Water Supply Section on October 26, 2005. He stated that the Public Water Supply Section has no jurisdiction in the permit process and that the jurisdiction corresponds to the Land Quality Section. Mr. Knox stated the Public Water Supply Section might have some jurisdiction if the activities affect any public water supply system.

Mr. Knox informed Altamont that there were a few small public water supply systems in the area, but due to contamination from a mill, the systems were closed and only some private wells remain in the area. According to Mr. Knox, the Public Water Supply rules require a setback of 100 feet between a water supply system and potential sources of contamination.

Additionally, he indicated that the City of Forest City is in the process of acquiring a permit to install a water intake from the Broad River close to Henrietta. Mr. Knox said that if that occurs, the water use classification will become more stringent and that additional restrictions could affect the quarry.

Altamont called the City of Forest City on October 28, 2005 to ascertain additional information regarding the proposed water intake. According to information provided by Mr. Keith Webb, an engineer working on behalf of the city, the intake is located more than a half mile from the proposed quarry. Therefore, the quarry would be outside the Critical Area (as defined by the Rutherford County Watershed Protection Ordinance) for the proposed intake.

Altamont interviewed Mr. Roy Davis with the regional Surface Water Protection Section on October 26, 2005 to ascertain information regarding regulation of mining and asphalt plants. Mr. Davis stated that

the section has no jurisdiction in the permit process, beside providing comments to the licensing agency. According to Mr. Davis, the mining industry is not authorized to discharge untreated water used to wash crushed stone into the waters of North Carolina. The general permit is based on reuse and treatment of the washwater.

4.1.7 Rutherford County Watershed Ordinance

The Rutherford County Application for a Watershed Permit submitted by Long Branch Partners indicated that the proposed project was a crushed stone facility to be located in the Hog Pen Branch watershed. The applicant indicated that the proposed location was not in a Critical Area or Flood Plain.
Items which are required with the application include:

- Complete set of plans for the proposed project
- Approval letters from multiple divisions involved from NC DENR
- Approval letter from US Army Corps of Engineers
- Deed/lease agreements of all properties involved.

Of the required items, only the first was included with the application provided to Altamont.

4.2 COMPLIANCE HISTORY

4.2.1 Applicants

4.2.1.1 APAC - Atlantic

DENR Division of Air Quality

Altamont reviewed three compliance-related categories for APAC – Atlantic operations in the previously listed counties:

- Notice of Violation (NOV),
- Notification of Initiation of Enforcement Action, and
- Notification of Objectionable Odors and Requirement to Implement Maximum Feasible Controls

As stated in Section 3.2.1, Altamont reviewed a document prepared by BREDL and verified all of the NOVs included in the document by reviewing information at the DENR Asheville Regional Office. In addition to the NOVs cited by BREDL, Altamont identified six other NOVs not listed by BREDL.

The results of previous compliance issues are tabulated in Table 1 – Air Quality Violations for APAC-Carolina, Inc. This review is not an exhaustive study, but should serve as an accurate representation of the regulatory compliance history for APAC-Carolina in the region. Violations for APAC – Carolina, Inc.

As shown, the air quality violations pertain almost exclusively to dust emissions (TSP and PM-10) from the bag filter exhaust. Two violations issued by DENR may have pertained to toxic air pollutants (i.e., the 2002 violations reported for the Hendersonville facility). The violations reported for this facility pertained to the Total Halogen Concentration in No. 4 fuel oil combusted in the drum dryer, and objectionable odors emitted from the plant.

DENR Division of Land Resources – Land Quality Section

No violations of mining or land disturbance regulations were located for APAC-Carolina, Inc.

U.S. Corps of Engineers

Enforcement documents requested from the USACE have not been received by Altamont.

DENR Division of Water Quality – Aquifer Protection Section

On October 26, 2005, Altamont contacted Mr. Qu Qi, a hydrogeologist in the Asheville Regional Office. Mr. Qi was contacted to determine whether the section has any record of groundwater incidents for which APAC – Atlantic was the responsible party. Mr. Qi stated that no violations were on record in the DWQ Groundwater Incident database for APAC.

DENR Division of Water Quality – Surface Water Protection Section

Stormwater

Ms. Janet Cantwell of DWQ stated that NPDES stormwater discharge violations are rare since DWQ must be notified and subsequently find a violation during a visual inspection. For requisite annual stormwater discharge analytical monitoring, a permittee is only obligated to measure Total Suspended Solids (TSS) and Total Flow. Mr. Ken Pickle, with the DWQ NPDES Unit in Raleigh, stated that although a Stormwater Pollution Prevention Plan must be developed by each facility and analytical monitoring must be conducted, neither federal nor state regulations provide for extensive numerical limits on pollutants in stormwater discharge. The general permit includes numerical limits for TSS, pH, and Oil and Grease; the latter two are for Vehicle Maintenance activities.

Surface water

Mr. Kevin Barnett of the DWQ stated that the Asheville Regional office had not issued APAC-Atlantic a 401 Water Quality Certification at any time in the past. Mr. Barnett said that, in his experience, APAC-Atlantic normally leases sites from local quarries and is not required to apply for separate 401 Water Certifications for their facilities.

A database search conducted by Mr. Frost showed no surface water violations for APAC-Atlantic in the region. Mr. Frost stated that in his five years with the DWQ Asheville Regional Office, no surface water violations had been issued to asphalt plants.

4.2.1.2 Long Branch Partners

Georgia EPD Air Protection Branch

Altamont made two telephone calls were made to Lou Musgrove, Stationary Source Compliance Program Manager of the Georgia EPD Air Protection Branch on October 28 and 31, 2005. The calls were made to obtain a summary of compliance. Mr. Musgrove returned Altamont's phone calls on November 2, 2005 and stated that Altamont should contact Mr. Bob Tatum in the Georgia EPD's Mountain District Office. Mr. Bob Tatum was called on November 2, 2005. He stated that an air quality violation had not occurred at the facility since the Mountain District Office took over regulatory oversight in the summer of 2002.

Furthermore, compliance information is summarized in an Enforcement Order database accessible from the EPD website. The database was accessed and reviewed on October 31, 2005 by Altamont. No violations were listed for Long Branch.

Land Quality

No violations of mining or land disturbance regulations were located for Long Branch.

U.S. Corps of Engineers

Documents requested from USACE regarding enforcement actions have not yet been received by Altamont.

DENR Division of Water Quality, Aquifer Protection Section

On October 26, 2005, Altamont contacted Mr. Qu Qi, a hydrogeologist in the Asheville Regional Office. Mr. Qi was contacted to determine whether the section has any record of groundwater incidents for which Long Branch is the responsible party. Mr. Qi stated that no violations were on record in the DWQ Groundwater Incident database for Long Branch.

DENR Division of Water Quality, Surface Water Protection Section, and Georgia EPD Water Resources Branch

Stormwater

One US EPA enforcement record for Order Number EPD-WQ-35 was listed for Long Branch Quarry. The record cited NPDES permit violations as the cause of the order. The quarry was required to maintain Best Management Practices (BMPs) for soil erosion, monitor boundaries to ensure that BMPs are installed and working effectively, and pay a settlement amount of $1,250.

Surface water

Mr. Kevin Barnett (DWQ) stated that the Asheville Regional office had not issued Long Branch a 401 Water Quality Certification, other than that issued to the Henrietta Quarry on September 16, 2005. Therefore, no violations are on record for Long Branch at the DWQ Asheville Regional Office.

A database search conducted by Mr. Frost of the DWQ showed no surface water violations for Long Branch Partners in the region. Mr. Frost stated that in his five years with the DWQ Asheville Regional Office, no surface water violations had been issued to asphalt plants.

4.2.2 Industries in Region

DENR Division of Air Quality

Mr. Paul Muller, regional supervisor of the DENR DAQ in the Asheville Regional Office, stated that the most common violation associated with asphalt plants relates to particulate emissions, or dust. Such violations represent a lack of compliance with general condition B,6 of a DAQ operating permit. General condition B,6 states:

> *"This permit is subject to revocation or modification by the DAQ upon a determination that information contained in the application or presented in the support thereof is incorrect, conditions under which this permit was granted have changed, or violations of conditions contained in this permit have occurred. The facility shall be properly operated and maintained at all times in a manner that will effect an overall reduction in air pollution. Unless otherwise specified by this permit, no emission source may be operated without the concurrent operation of its associated air cleaning device(s) and appurtenances."*

Activities that trigger a violation of this condition are typically associated with poor maintenance of air filtration devices. The second most common trigger, according to Mr. Muller, is fugitive dust emissions from trucks and heavy equipment traffic on unpaved roads.

The most common violations associated with quarry and concrete plant operations are also typically related to a lack of compliance with general condition B,6. Concrete plants are in violation of this general condition when the bag filter on the cement storage silo or bin is broken and cement dust is emitted to the air during cement delivery operations. Quarries are in violation of this general condition wet suppression systems are either malfunctioning or not operating.

Mr. Muller was asked about issues concerning organic pollutants and odor violations. He stated that such violations are typically only associated with asphalt plants and that DAQ operating permits for asphalt facilities have a specific condition to address odors. The specific condition is as follows:

> *"As required by 15A NCAC 2D .1806 "Control and Prohibition of Odorous Emissions" the Permittee shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary."*

Mr. Muller went on to say that typically, only continuous complaints from the public trigger a violation of this condition, and because of the nature of the violation and the potentially "arbitrary and capricious" nature of the regulation, it is rarely enforceable.

DENR Division of Land Resources – Land Quality Section

The vast majority of violations in North Carolina on the DENR Land Quality Section website that were assessed environmental fines, were for entities that were mining without a permit. From 2000 to 2005 there were eight fines for mining without a permit and one fine for a violation of the mining permit regulations.

U.S. Corps of Engineers

Ms. Nancy Wallace of the Asheville Regulatory Field Office stated that the most common violations associated with asphalt plants, concrete plants, and quarries are based on operators using wetlands to stage materials.

DENR Division of Water Quality – Aquifer Protection Section

Mr. Qi of the Asheville Regional Office, Aquifer Protection Section stated that in his experience, groundwater violations by asphalt plants were due to above ground storage tank leaks and equipment leaks. BREDL identified a specific instance where the Aquifer Protection Section issued an incident number. In response, Altamont reviewed a file for the Maymead Asphalt Plant located in Pineola, North Carolina and questioned Mr. Qi about the specific incident. Mr. Qi stated that a release of oil was

remediated and the incident was closed by DENR. The file review showed that spill was observed in a ditch in the facility. The source was identified as an aboveground oil storage tank area. The file shows that the Aquifer Protection Section closed the incident after the asphalt plant completed soil sampling and remedial activities.

Mr. Qi stated that in his experience, groundwater violations were not typically issued to concrete plants or quarries.

DENR Division of Water Quality – Surface Water Protection Section

Ms. Bethany Georgoulias, a staff engineer with the DWQ NPDES unit, provided information on the enforcement activities related to concrete plants. She stated that violations typically are due to inadequate treatment of process wastewater. Ms. Georgoulias said that concrete plants are cited for inadequate treatment of wastewater when Discharge Maximum Daily Limits established for each type of wastewater in the General Permit NCG140000 are exceeded.

Mr. Ken Pickle, of the DWQ NPDES unit, stated that he is not aware of enforcement related to asphalt plants, quarries, and sand pits.

Mr. Kevin Barnett, of the DWQ Asheville Regional Office, stated in an interview conducted on November 1, 2005, that 401 Water Quality Certification permit compliance violations are rare for industries such as asphalt plants, concrete plants, quarries, and sand pits because of DWQ inspection efforts during construction.

Mr. Larry Frost, of the DWQ Asheville Regional Office, stated that of the industries in question, he is aware of violations only for concrete plants. Mr. Frost said that most often water quality standards violations are issued to concrete plants for exceeding pH limits established in 15A NCAC 02B.

On November 8, 2005, Mr. Roy Davis stated that he was aware of one Notice of Violation. It was issued to Macon Construction for a release of diesel fuel. Mr. Davis did not know the extent of the release.

4.3 CURRENT INDUSTRY SITING CONSIDERATIONS IN APPLICABLE SETTINGS

Altamont researched environmental considerations related to siting similar industrial land use practices. The research is organized in three sections: air quality, water quality, and land use.

Air Quality

Organic Pollutants

Asphalt cement, the source of organic pollutants at hot mix asphalt plants, is a highly variable product. The concentration and volatility of organic pollutants in the material change depending on the supplier and source.

DENR requires that estimates of air emissions from hot mix asphalt plants be based on US EPA AP-42 emission factors, or information from source-specific emission tests or continuous emission monitors. The US EPA emission factors for organic pollutants emitted from hot mix asphalt plants are provided on AP-42 Table 11.1-10. The table is included in Appendix D. The emission factors are used to estimate the mass rate of pollutants that are being emitted from the processes associated with asphalt plants (e.g., pounds per day).

Not every organic pollutant has an emission factor. The organic pollutants for which there are emission factors were determined based on US EPA tests and studies. Organic pollutants for which there are no emission factors were either not detected or not analyzed during emissions tests that were used to develop the emission factors.

Furthermore, for organic pollutants that do have emission factors, the DENR and EPA admit that these factors have significant limitations. Note the following excerpt from the introduction to AP-42:

> *"Emission estimates are important for developing emission control strategies, determining applicability of permitting and control programs, ascertaining the effects of sources and appropriate mitigation strategies, and a number of other related applications by an array of users, including federal, state, and local agencies, consultants, and industry. Data from source-specific emission tests or continuous emission monitors are usually preferred for*

estimating a source's emissions because those data provide the best representation of the tested source's emissions. However, test data from individual sources are not always available and, even then, they may not reflect the variability of actual emissions over time. Thus, emission factors are frequently the best or only method available for estimating emissions, in spite of their limitations."

Emission factors are specific to activities and sources. They work by relating the quantity of a pollutant released to unit weights, volumes, distances, or durations of an activity emitting the pollutant (e.g., pounds of organic pollutant per ton of asphalt processed). The factors are averages of available data and are assumed to be representative of long-term averages for all facilities of that type (i.e., there are emission factors for hot mix asphalt plants that are "batch" plants and "drum mix" plants). However, the "Minority Report on Fugitive Emissions from Asphalt Plants" provided by BREDL (Appendix D) suggests that the emissions factors for asphalt plants are not representative of periods of high emissions, when emission factors can increase by more than 600 percent (%) due to increased operating temperature (an increase from 325 to 375 °F) and percent volatile content in the asphalt cement (an increase from 0.5 to 1 percent).

The emission factors in combination with proposed facility characteristics, such as capacity in tons per hour, result in the mass of organic pollutant emitted from that source (e.g., pounds of benzene per hour emitted from the plant). Typically, organic pollutant mass emission rates are estimated for a proposed facility and the emission rates are submitted to DENR to make a determination on whether a permit from the DAQ is required, and if required, the type of permit needed.

In addition to determining the need for a permit and, if necessary, the type of permit required, DENR will compare some of the organic pollutant emissions to the toxic pollutant exemption rates (TPERs) contained in 15A NCAC 2Q .0711. If the TPERs are exceeded, then DENR will request a facility-wide demonstration that emissions of toxic air pollutants from a proposed facility will not exceed acceptable ambient levels (AALs) contained in 15A NCAC 2D .1100.

AALs differ and cannot be compared to emission rates. AALs represent the pollutant mass in a volume of air. This is a measurement of concentration (e.g., milligrams of organic pollutant per cubic meter of air). As stated previously, emission rates represent a pollutant mass emitted over time (e.g. pounds per day). To obtain an estimate of a pollutant concentration, the pollutant emission rate along with meteorological data and source information, like emission stack heights, are used in air quality models. These models use mathematical and numerical techniques to simulate the physical and chemical processes that affect air pollutants as they disperse in the atmosphere. The models are designed to estimate the concentration of a pollutant at a receptor. For instance, benzene emitted directly into the atmosphere by a hot mix asphalt facility would be modeled to estimate the concentration in the ambient air at a house located 500 feet from the asphalt facility's property boundary.

There is some concern with air quality models and their ability to accurately represent the dispersion that occurs in mountainous areas. Therefore the resulting ambient air concentrations predicted by an air quality model may be flawed.

In discussions with Mr. Tom Anderson of the DAQ, Altamont was told that air quality models are continuously being refined and that professional judgment must be used when applying any model. Concerns with the models center mostly on the use of meteorological data that may not be applicable and on a particular model's inability to predict concentrations near the ground surface, where frictional effects influence atmospheric behavior. For mountainous terrains, Mr. Anderson stated that alternative estimates of ambient air quality concentrations may be obtained through application of more conservative air quality models or through the collection site-specific meteorological data.

Large amounts of data document the effects of exposure to organic pollutants in the work place. However, exposure data from the work place is generally based on concentrations much higher than those experienced in the ambient air. For instance, the National Institute for Occupational Safety and Health (NIOSH) has a published Recommended Exposure Limit (REL) for benzene of 0.32 milligrams per cubic meter (mg/m^3). NIOSH RELs are eight or ten hour time-weighted average exposure concentrations recommended on the basis of an evaluation of health effects data. RELs are generally based on the most sensitive adverse health effect reported in medical and toxicological literature. The

NIOSH REL for benzene is more than 1,000 times greater than the AAL for benzene defined under 15A NCAC 02D .1104, which is 0.00012 mg/m³. Furthermore, this REL represents a threshold for safe exposure to benzene while at work. Relatively little is known about the specific effects of organic pollutants that would be found at the concentrations in ambient air.

Modeling results also provide concentrations of specific contaminants at specific locations, at specific intervals in time. The DENR admits that the multiplicative effects of human exposure to ambient air concentrations of more than one contaminant is rarely addressed. The following excerpt is from the DENR Division of Air Quality's *An Introduction to Risk Assessment, Risk Management and The Division of Air Quality Air Toxics Program*:

> *"Many pollutants will act together to produce greater, or in some cases less, toxicity to exposed individuals. Most toxicological data is available for single pollutants, making multiple pollutant risk assessment problematic. DAQ regulations will allow for consideration of multiple pollutant risk if there is "evidence that two or more toxic air pollutants being emitted from a facility or combination of facilities act in the same way to affect human health" (15 NCAC 2D .1108)."*

DENR DAQ may consider "additive" toxicity when considering the impact of multiple pollutants with similar effects. These types of demonstrations could be used by DENR to consider additional appropriate control measures.

Based on a review of information provided by Rutherford County to Altamont, including studies cited by the BREDL, specific organic pollutants of particular concern include the following:

- Formaldehyde
- Hydrogen Sulfide

Emission factors for formaldehyde are included in AP-42. Therefore, through modeling, concentrations of formaldehyde in the ambient air can be estimated prior to siting a proposed asphalt facility. With such

estimated ambient air concentrations, a comparison of the AALs to anticipated concentrations can be made.

AP-42 does not contain emission factors for hydrogen sulfide. Therefore, an estimate of hydrogen sulfide ambient air concentrations is typically not made for hot mix asphalt plants. The DENR conducted a study at a hot mix asphalt facility in Salisbury, North Carolina and estimated emission factors for hydrogen sulfide. The estimated emission factors are provided in a DENR document titled *Investigation of Asphalt Terminal Modeling Scenario*. However, DENR justifies exclusion of these emission factors when estimating hydrogen sulfide emissions from hot mix asphalt facilities, based on the following conclusion in the referenced document:

> *"The [hot mix asphalt plant] dryer-mixer flowrate is 1,000 fold greater than [asphalt] terminal tank fillings. This results in more favorable dispersion of the hot-mix plant's H_2S emissions; off site impacts are very low, even below odor thresholds. APAC is apparently similar in size and operation to the other 210 statewide hot-mix asphalt plants. Given this similarity, hot-mix plants are expected to cause minimal public exposure to H_2S and will not be discussed here further."*

In light of DENR's conclusion regarding hot mix asphalt plants, Altamont contacted Mr. Mike Tollstrup, with the California Air Resources Board to determine if the State of California has developed an emission factor for hot mix asphalt plants. California historically has the highest state air quality standards. Altamont attempted to contact Mr. Tollstrup on November 1, 2005. However, he could not be reached. A message was left requesting that he call Altamont.

Criteria Pollutants

Industries such as asphalt plants, concrete plants, quarries and sand pits all have associated particulate emissions. Particulate emissions are one of six "criteria pollutants" which the US EPA has established and DENR has adopted as indicators of air quality. For each of these "criteria pollutants," DENR has established maximum ambient air concentrations above which adverse effects on human health may occur. Maximum ambient air concentrations are set forth in 15A NCAC 2D .0403 for total suspended

particles (TSP) and in 15A NCAC 2D .0409 for particulate matter less than 10 micrometers in diameter (PM-10).

As with organic pollutants, US EPA AP-42 has emission factors for TSP and PM-10 based upon the type of operation occurring. The emission factors are used to estimate the mass rate of TSP and PM-10 emitted from a source based upon the activity. The following sections of AP-42 apply to asphalt plants, concrete plants, and quarries. (***Note:*** Based on a November 1, 2005 conversation with Paul Muller of the DENR DAQ, sand pits are considered categorically exempt from permitting because the processes associated with sand pit operations are thought of as water saturated and therefore do not create substantial levels of particulate emissions).

- Asphalt plants – Section 11.1
- Concrete Plants – Section 11.12
- Quarries – Section 11.19.2

As with organic pollutant emission rates, TSP and PM-10 emission rates are estimated for a proposed facility. The emission rates are submitted to DENR to make a determination on whether a permit from the DAQ is required, and if required, the type of permit needed. Based on a November 1, 2005 telephone conversation with Mr. Jerry Freeman in the Raleigh Central Office, DENR now requests that particulate matter emission rates associated with proposed quarries and co-located facilities (i.e., asphalt and concrete plants) be modeled together to determine compliance with the ambient air concentrations for TSP and PM-10.

Although particulate matter, or dust emissions may seem to only create a negative aesthetic impact the US EPA website regarding PM-10 emissions (http://www.epa.gov/air/airtrends /aqtrnd95/pm10.html) provides the following statement:

> *"Major concerns for human health from exposure to PM-10 include: effects on breathing and respiratory systems, damage to lung tissue, cancer, and premature death. The elderly, children, and people with chronic lung disease, influenza, or asthma, are especially sensitive to the effects of particulate matter. Acidic PM-10 can also damage human-made*

materials and is a major cause of reduced visibility in many parts of the U.S. New scientific studies suggest that fine particles (smaller than 2.5 micrometers in diameter) may cause serious adverse health effects. As a result, EPA is considering setting a new standard for PM-2.5. In addition, EPA is reviewing whether revisions to the current PM-10 standards are warranted."

Although uncontrolled particulate matter emissions pose a serious health risk, they can be easily controlled at asphalt plants, concrete plants, quarries and sand pits through employment of air pollution control devices. Air pollution control devices include wet suppression systems (water sprays) and fabric filters (baghouse filters). By employing such systems on stone crushing and aggregate segregation and movement processes, emissions of particulate matter can be adequately controlled.

Additionally, Rutherford County provided Altamont a document entitled *An Overview of Polluting Industry Ordinances: The Wilkes County Model*. This document was prepared by BREDL and contains a recommendation for a 2,000 feet minimum setback from high impact land uses "to shield vulnerable children and elderly people from toxic air pollutants." The basis for this recommendation was not described by BREDL.

Odor

In a document entitled *An Overview of Polluting Industry Ordinances: The Wilkes County Model*, BREDL recommended a 3,000 foot setback from high impact land uses. This recommendation was made on the basis of reports of noxious odors and negative property value impacts at that distance.

4.3.1 Water Quality

US EPA regulations currently governing Water Quality Planning and Management are contained in Part 130 of Title 40 of the Code of Federal Regulations. The purpose of the watershed regulations is to reduce non-point source pollutants and protect the quality of our drinking water supplies. In North Carolina, the jurisdictions having land use control over the watershed areas for drinking water supply are required by 15A NCAC 02B .0216 to have ordinances in place to protect water quality from discharges of non-point source pollutants associated with new development within the watershed. Protected water supplies are classified as Class WS-I, WS-2, WS-3 and WS-IV.

Rutherford County developed a Watershed Protection Ordinance under this mandate. The ordinance specifies Development Regulations, Public Health Regulations, and Enforcement within the watershed.

Article 300 of the ordinance, "Development Regulations," establishes watershed areas (WS-IV-CA and WS-IV-PA), built-upon density limits, and buffer area requirements. A Class WS-IV watershed is a protected water supply area, which is generally in moderately to highly developed watersheds. Each WS-IV watershed contains the following areas:

1. The critical area is one-half (1/2) mile and draining to water supplies from the normal pool elevation of reservoirs or to a river intake.
2. Protected area is five (5) miles and draining to water supplies from the normal pool elevation of reservoirs, or ten (10) miles upstream of and draining to river intake.

The maximum built-upon surface for non-residential uses is 24 percent, unless a high-density option is approved. A minimum buffer of 100 feet is required for all new development activities that exceed the low-density option. Otherwise, a minimum 30-foot vegetative buffer is required along all perennial waters.

Stream buffers provide numerous water quality protection benefits including: sediment removal, chemical removal, temperature moderation, and flood mitigation. Buffer width has been found to have a substantial impact on the rate of pollutant removal (Triangle J Council of Governments – Appendix D). Altamont reviewed several studies and government ordinances to compare buffer width recommendations and requirements (Table 3). Buffer widths varied from 30 feet to over 100 feet (variable width buffers with base width plus additional two feet per one percent slope of the stream valley). A number of variables affect the function and performance of buffers including slope and vegetative makeup (Carl Vinson Institute of Government – Appendix D).

Several North Carolina counties, including Rutherford County, follow the Model Watershed Protection Ordinance provided by the North Carolina DWQ Water Supply Watershed Protection Program (Appendix A). However the ordinance does not account for site specific or region specific conditions.

Public Health Regulations described in Article 400 of the Rutherford County Watershed Protection Ordinance, Section 401 state:

> *"No activity, situation, structure or land use shall be allowed within the watershed which poses a threat to water quality and the public health, safety and welfare. Such conditions may arise from inadequate on-site sewage systems which utilize ground absorption; inadequate sedimentation and erosion control measures; the improper storage or disposal of junk, trash, or other refuse within a buffer area; the improper management of stormwater runoff; or any other situation found to pose a threat to water quality."*

In addition, the NC surface water quality standards contained in 15 NCAC 02B.0216 state:

> *"The best usage of WS-IV waters are as follows: a source of water supply for drinking, culinary, or food-processing purposes for those users where a more protective WS-I, WS-II or WS-III classification is not feasible and any other best usage specified for Class C waters. Sources of water pollution which preclude any of these uses on either a short-term or long-term basis shall be considered to be violating a water quality standard".*

If industries meet the terms of the required permits, the activities of the industries are generally not recognized to pose a threat to water quality and the public health. However in the past, Notices of Violation (NOVs) and enforcement orders have been issued to these and similar industries; suggesting failed or inadequate process controls. In these cases, regulatory records and several studies suggest potential threats to water quality.

Deposition

BREDL provided to Rutherford County the results of a study whose purpose was to evaluate water quality near an asphalt plant in Pineola, North Carolina. The analytical results and a project narrative were forwarded to Altamont. The analytical reports showed formaldehyde concentrations of 230 micrograms per liter (µg/L) in a stream and 220 µg/L in a well near the asphalt plant (Appendix D).

Neither of the North Carolina regulations applicable to surface water (15A NCAC 2B) or groundwater (15A NCAC 2L) contain a standard for formaldehyde. In addition, while chromium, cadmium, manganese, chloroform, and nickel were detected, the concentrations did not exceed the respective groundwater or surface water standards.

BREDL states that the DENR Division of Air Quality Emissions Inventory Review for the Pineola asphalt plant listed actual formaldehyde air emissions of 210 pounds/year (Appendix D). Although formaldehyde is a gas at room temperature, it is readily soluble in water (greater than 100 g/100 ml solubility). A Toxicological Profile for formaldehyde compiled by the Agency for Toxic Substances and Disease Registry (ATSDR) stated that because of its high solubility, there will be efficient transfer of formaldehyde into rain and surface water (Appendix D).

BREDL reported that a subsequent sampling by the DENR Division of Water Quality did not confirm the findings of formaldehyde in surface water and groundwater. Rainfall may dilute surface water concentrations of formaldehyde, as suggested by BREDL. However, considering the large difference in flow velocities of surface and groundwater, this explanation would not account for the absence of formaldehyde in the DENR groundwater sample.

Leaching

A counter-flow drum mix asphalt plant, the type proposed for Henrietta, utilizes asphalt cement storage tanks. Asphalt cement is heated in these tanks and subsequently piped to a counter-flow drum mixer, where it is combined with aggregate. The process flow diagram included in Appendix D depicts this process.

In hot-mix asphalt, asphalt cements are used as binders. They typically comprise four to ten percent of the mixture (Roberts 1996). Asphalt cement is the residuum produced from the distillation of crude petroleum and is solid or viscous liquid at room temperature. The exact chemical composition is dependent on the original crude petroleum and the manufacturing process, but consists mainly of aliphatic compounds, cyclic alkanes, aromatic hydrocarbons, polycyclic aromatic hydrocarbons (PAHs) and metals (Cicads 59).

Asphalt cement storage tanks typically utilize secondary containment to prevent releases to the environment in the case of leaks or spills. Releases from tanks, piping, or the counter-flow drum mixer have the potential to come in contact with water. Such contact may lead to the leaching of components from the asphalt into the environment (Brandt 2001).

Several studies have examined aqueous leaching of the chemical components of asphalt. Kreich (1997) reported leach tests of hot mix asphalt in which naphthalene, a PAH, was detected at 250 nanograms per liter (ng/L) while all other PAHs tested were below the detection limit. The study utilized the Toxic Characteristics Leachability Procedure (TCLP) in accordance with US EPA guidelines to test asphalt samples. The North Carolina surface water standard for naphthalene is 78 µg/L, almost three orders of magnitude greater than the amount detected by this study.

Based on the results from animal studies, the North Carolina Department of Health and Humans Services (DHHS) concluded that naphthalene is reasonably anticipated to be a human carcinogen. The International Agency for Research on Cancer (IARC) concluded that naphthalene is possibly carcinogenic to humans. The US EPA determined that naphthalene is not classifiable as to human carcinogenicity (ATSDR 2001).

Cooper (1996) assessed the impact of runoff from asphaltic products and found that concentrations of all PAH analytes were below the detection limit of 0.5 µg/L, while concentrations of heavy metals (cadmium, lead, and zinc) were elevated in runoff waters relative to upstream samples. North Carolina surface water standards in 15A NCAC 2B are 2 µg/L for cadmium, 25 µg/L for lead, and 50 µg/L zinc (Appendix E).

Sedimentation

Altamont, reviewed several studies on the effects of concrete plants and rock quarries on water quality (Appendix D). A study conducted by the Committee on Government Reform and the US House of Representatives (2002) includes the following statement:

"(there is) little information regarding the quantity of pollutant releases to surface water or ground water from the mining operations. Potentially, pollutant releases could affect water quality through surface stormwater runoff, releases to exposed groundwater in the pit, or releases at the surface that seep into the groundwater in the area."

The study concludes that,

"Many of the mining operations do not appear to be required to report their air emissions or discharges to surface water or groundwater. There appears to be little direct monitoring of air emissions and water discharges from the gravel mines".

The study also concludes, regarding air pollution (also applicable to surface and groundwater):

"But an accurate, comprehensive risk assessment of the effect of the gravel mining operations is currently not possible given the available data."

Altamont also reviewed a report on "Hydraulic Impact of Quarries and Gravel Pits" prepared by the Minnesota Department of Natural Resources, Division of Waters (2005). The intent of the report is included in the following statement:

"to help local officials, the public, and the mining industry understand the main issues surrounding mine establishment and to provide suggestions for monitoring and mitigation strategies to prevent significant impacts on water resources."

The report focused on effects of the dewatering process on local groundwater flow, changes in turbidity, interruption of groundwater flow due to rock removal, and temperature changes in springs and surface-water streams. According to the report the following were observed:

- Dewatering causes a significant decline in aquifer water levels
- The hydraulic gradient between the upper and lower aquifer reversed in one case

- Gaining creeks change to loosing streams
- In bedrock wells, turbidity is not affected by blasting while in shallow aquifer wells the study observed a slight increase in turbidity
- Mining has altered groundwater flow path affecting the water supply of the area
- Temperature measurements indicated increase on water temperature. The change in water temperature in one case change was 17 degrees. The study stated, "Temperature changes in this magnitude could have a negative effect on fish population…." This may also be true for other types of aquatic life.

According to 15NCAC 02B.0211 (k):

> *Turbidity: the turbidity in the receiving water shall not exceed 50 Nephelometric Turbidity Units (NTU) in streams not designated as trout waters; if turbidity exceeds these levels due to natural background conditions, the existing turbidity level cannot be increased. Compliance with this turbidity standard can be met when land management activities employ Best Management Practices (BMPs) [as defined by Rule .0202 of this Section] recommended by the Designated Nonpoint Source Agency [as defined by Rule .0202 of this Section]. BMPs must be in full compliance with all specifications governing the proper design, installation, operation and maintenance of such BMPs;*

A third study reviewed by Altamont was conducted by California Regional Water Quality Control Board, Central Valley Regional (2004). The study examined sand and gravel operations where the rock was mined using drilling and blasting. The study revealed that in the sand and gravel operations, wastewater from a settling pond had exceeded US EPA maximum contaminant levels (MCL) for manganese. Additionally, pH levels exceeded the federal drinking water secondary MCL. Analysis of the wash water from an associated concrete batch plant indicated that it was impaired by metals. Accordingly, wash water released to the subsurface has the potential to impair the use of groundwater for domestic and agricultural purposes.

Land Use

Research into the land quality management practices was based on two methods: online searches and telephone interviews. Altamont reviewed online information or interviewed personnel engaged in planning at the local government level in approximately 40 towns, cities, or counties.

The research focused on three land use planning mechanisms utilized in North Carolina. Rutherford County requested that the research search for scientifically derived rules, where applicable. The online searches and interviews sought information on the following land use planning mechanisms:

- Setbacks
- Zoning Ordinances
- Single Use Ordinances

This research included North Carolina communities and other states with potentially more restrictive standards. Rutherford County requested that the research search for scientifically derived rules, where applicable. As shown in Table 2, two principal mechanisms are used to manage the siting of heavy industry: zoning and stand-alone ordinances.

5.0 CONCLUSIONS

Rutherford County instructed Altamont to conduct an independent third-party review and make any recommendations "based on sound scientific basis for a proper protective separation distance" from "certain industries," as defined in the School Zone Protective Ordinance. The County asked that the review focus on the protected watershed and water quality issues.

In summary however, there is an absence of scientific studies with clear conclusions regarding industry setbacks. Likewise, there is no unanimity expressed in the wide range of setbacks used by local governments. As a result, there is no equitable basis on which Altamont can recommend fixed setbacks using existing information.

The following conclusions are presented in accordance with key elements discussed in this evaluation:

Air Quality

If operations are conducted at the proposed facilities just as they are described in the permit applications, then air quality standards will not be exceeded at the property line. However, not every compound that may be of concern or present in processes is accounted for in the emission estimates. Additionally, not every compound in the emission estimate is modeled to determine off-site impact.

Regulatory enforcement of the industries within this group is problematic given the subjective manner in which the effects on environmental quality are gauged (e.g., odor at the property boundary, visible dust from a stack or stack opacity, etc.).

Land and Water Quality

Engineering plans submitted to the various regulatory agencies for the proposed quarry detail erosion and sedimentation controls for land disturbances that will occur during the first three years. After year three, mining operations will include two additional pit areas, deeper pit excavation, and quarrying of an existing streambed. A mitigation plan involving the relocation of this stream has not been provided by the applicant to the regulatory agencies. Additionally, erosion and sedimentation control measures have

not been provided for disturbances that will be related to asphalt and, potentially, concrete operations. Therefore, the applicants have not yet submitted adequate information to the state demonstrating that onsite activities will not result in degraded water quality.

If the applicants receive all of the necessary permits and meet their terms, the activities of the industries are generally not considered to pose a threat to water quality and the public health. However, Altamont observed in the compliance research, that Notices of Violation (NOVs) and enforcement orders have been issued to similar industries, suggesting failures or inadequacies in process controls. In these cases, regulatory records and several studies suggest potential threats to water quality.

Land Use

The School Zone Protective Ordinance includes a list of "certain industries" and states that they may not be located within 2,000 feet of public and charter schools. While this ordinance may protect children and school employees, the County has no apparatus in place to protect those outside school districts. Conversely, the 2,000-foot setback was not based on scientifically applied methods or on a comprehensive review of land use patterns. As a result, the setback may be longer than necessary.

The Watershed Protection Ordinance includes the two following provisions for protection of water supplies:

- Buffers which must be installed near perennial streams and
- The requirement that "No activity, situation, structure or land use shall be allowed within the watershed which poses a threat to water quality and the public health, safety and welfare."

Although these measures may provide adequate watershed protections, the County has no way to make this determination.

Comparison of the stand-alone land use ordinances to zoning ordinances shows that zoning results in shorter setbacks. Zoning setbacks reviewed extend from 10 to 200 feet. Those established by stand-alone ordinances extend from 500 to 2,640 feet. BREDL recommended a 3,000-foot setback from high impact land uses. This recommendation was based on reports of noxious odors. A more in-depth basis was not provided.

6.0 RECOMMENDATIONS

Option 1 - Maintain the Status Quo:

In selecting this option, the County would keep the School Zone Protective (2001) and Watershed Protection (1997) ordinances in place unaltered. Together, these ordinances include two primary tools that are used to control land use: 2,000-foot setbacks of "certain industries" from schools as well as density limits and stream buffers. Additionally, the Watershed Protection Ordinance requires issuance of a permit before most building can occur in protected areas.

The benefits of this option are largely those of continuity and familiarity. Since both ordinances have been in place at least four years, enforcement mechanisms are functioning and residents have had time to understand the requirements. Still, shortcomings of this option are apparent in light of the significant gaps that exist in the protection of public heath and watersheds.

Clearly, protection of children while at school is essential. However, people, including children, spend far more time in residential and commercial areas than at school. If health and safety concerns related to heavy industries exist at school, then the same concerns should exist in other areas to an equal or greater degree.

Protection of Public Water Supply Watersheds is important as well. The existing 30-foot buffer for "Protected Areas" falls within the range of buffer distances used and recommended by others. However, the County would benefit by establishing a basis for determining whether current watershed protections are effective. The existing protective mechanisms leave the County without this ability.

Option 2 - Establish Setbacks Based on Scientific Methods:

This option would establish setbacks from heavy industries and protected streams on the basis of accepted scientific methods. The County would retain appropriately qualified technical consultants to conduct hydrologic modeling in watersheds and air dispersion modeling in likely industrial areas.

The benefit of this option would be setbacks that are modeled on actual Rutherford County conditions; not those developed by others in areas where topography, climate, and vegetation are different. The sources referenced in this report did not include a single study based on air samples collected in residential or commercial areas near the focus group of heavy industries. Although the existing data are clear in describing the health-effects of pollutants emitted by quarries, asphalt plants, and concrete plants, existing studies base their conclusions on samples collected within the plants or on data from laboratory studies of toxicity. Whereas many of these studies have been used to understand the health-risks to workers in these industries, they have not been used to reliably predict exposures outside the facility boundaries.

The science that calculates health risks is not black and white. Instead, it is based on assessments of three links in the chain of exposure: contaminant source – migration pathway – receptor. At each link, good scientists can debate the relative importance of many variables. The models, particularly those for air dispersion, are largely dependent upon actual operations at a facility. If the operating conditions are different from those used in the air dispersion model, the resulting air quality will be different from that predicted by the model.

Transport of sediment to streams can be somewhat more reliably predicted. However, as with any model, actual contaminant transport mechanisms are inherently tied to operating conditions. Additionally, the variety of topographic settings in Rutherford County mean that modeling would be most likely conducted for average conditions. As with air modeling, variance in the site conditions from those used in the model would result in water quality different from that predicted.

Consequently, if the County chooses this option, the debate may not be ended by the results of modeling. In addition, the County should consider that implementation of this option could easily require six more months. At that point, the County would then be in a position to determine how the setbacks should be put to use: through existing ordinances, which may have protective gaps; or through new ordinances, such as zoning.

Option 3 - Establish Setbacks Based on Current Land Use:

As in the previous option, this would result in establishment of setbacks. However, the key difference is that these setbacks would be developed using actual Rutherford County land use information. The County, using its own staff supplemented by appropriately qualified technical consultants, would map current land uses. Setbacks would be selected that maximize the desired protections, while providing continued siting opportunities for necessary industries.

The benefits of this option are based on recognizing that, while no system is perfect, consideration of actual land use is vital to achieving the dual purposes of protecting the residents while facilitating appropriate industrial development. Setbacks would be based on real land use conditions in the County, not hypothetical operating conditions for hypothetical industries.

Using recent and historic aerial photography, the County would assess current land uses, with respect to both location and type. Additionally, perennial streams in protected watersheds would be inspected to determine whether the existing buffers are effective in protecting water quality.

If Rutherford County were to implement this option, it would be in the company of virtually every local government that regulates the placement of heavy industries. As a rule, local governments use practical considerations in establishing setbacks. While there may be exceptions to this rule, this research showed that they are not numerous or well known.

As with the previous option, the County should plan on a six-month period to implement this option. Similarly, the County would still need to determine how the setbacks should be put to use; whether in existing ordinances or through new ordinances, such as those for zoning or focused on polluting industries.

If this option were employed using countywide zoning with a district for heavy industry, residents would achieve some peace of mind in knowing that they must not always be fighting against industry. Likewise, since this option is based on satisfying two goals, business planners could calculate the

probability of success without risking investments of time and expense necessary to justify "conditional" uses that are common when stand-alone ordinances are used.

Altamont Recommended Option:

Altamont recommends implementation of Option 3. Establishing setbacks using practical considerations works most effectively in achieving the goals established in the School Zone Protective Ordinance, the Watershed Protection Ordinance, the recent moratorium, and the desires of many County residents that the Board of Commissioners ensure that their health and the quality of their watersheds be protected.

Because this option uses existing County resources (e.g., staff and aerial photography expected for delivery in the first quarter of 2006), the County can maintain greater control of schedule and cost; while relying on experts when necessary. In addition, while collecting information on current stream conditions, the County can setup a water quality database that would allow them to measure the effectiveness of water quality protections over time. Many local governments spend money haphazardly without establishing baseline conditions. This option offers the opportunity for the County to excel in water quality protection, without placing unnecessary buffer requirements on its residents.

Altamont recommends implementing Option 3 using the following steps:

- Keep the School Zone Protective and Watershed Protection Ordinances in place during the implementation phase.
- Map land uses in the County by location and type (Use either County staff members or a consultant).
- Determine where current land uses accommodate placement of heavy industries; maximizing separation distances between moderately and heavily populated portions of the County; and considering the locations of existing industries.
- Evaluate the effectiveness of stream bank protective mechanisms by surveying perennial streams in protected watersheds. Inspect vegetation along the banks, and between the top of the bank and to sources of contamination. Measure water quality in times of little precipitation and shortly after heavy rainfall. These measurements should include turbidity, Total Suspended Solids, dissolved oxygen, and temperature.
- Combine the results of the land use and stream assessments and develop setbacks.
- Determine how the County would best accept implementation of these setbacks, bearing in mind that the large majority of local governments attempting this effort, use zoning.

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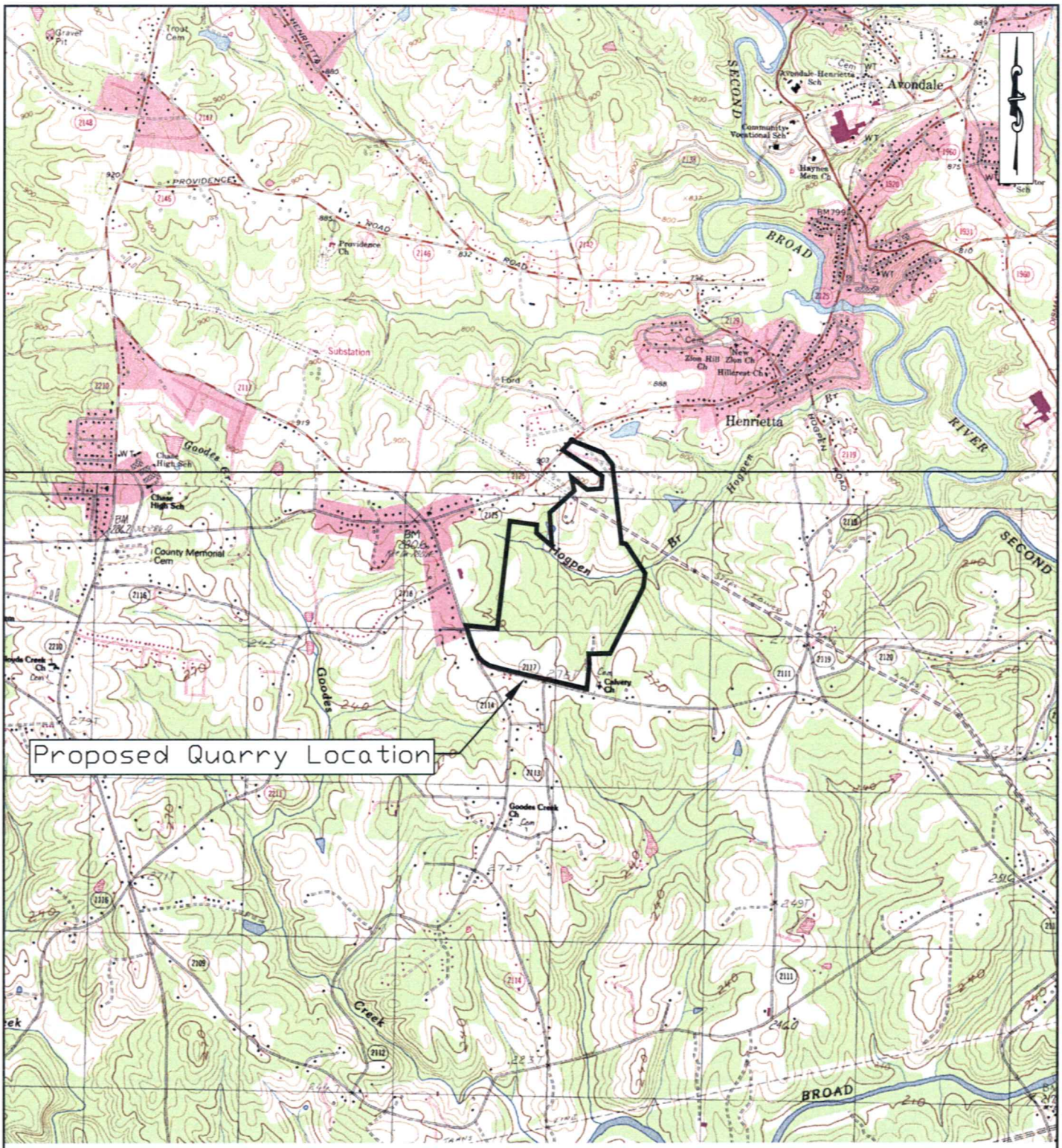
FIGURES



USGS 35081-C7-TF-024 FOREST CITY 1993

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SITE LOCATION MAP

PROPOSED HENRIETTA QUARRY
RUTHERFORD COUNTY, NC

FIGURE
1

DRAWN BY: PAUL DOW
PROJECT MANAGER: JIM MCELDUFF
CLIENT: RUTHERFORD COUNTY
DATE: 11/08/05

SCALE (FEET)
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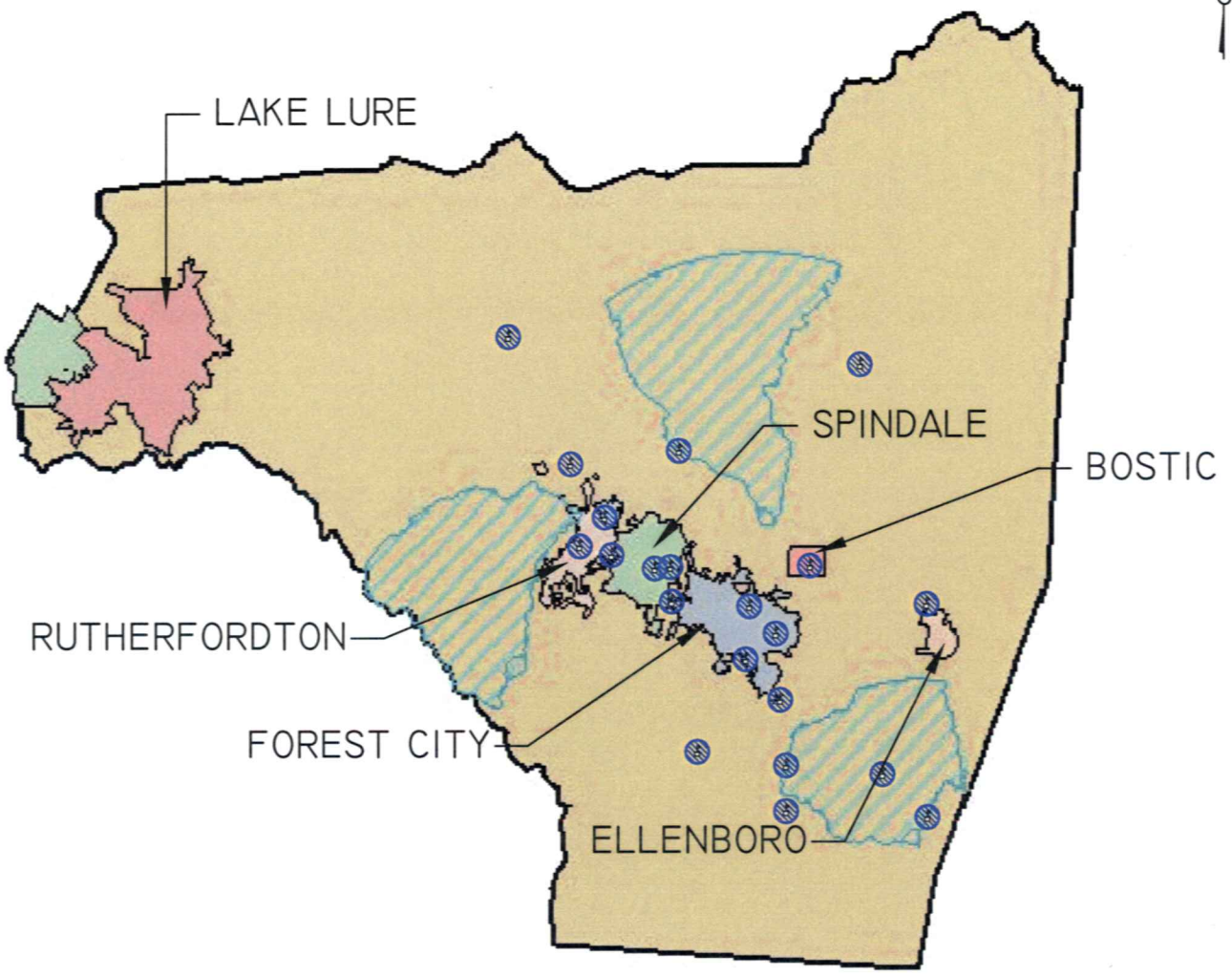

LEGEND

WATERSHED AREA

SCHOOL LOCATION WITH 2000' RADIUS

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WATERSHED AREAS AND SCHOOL LOCATIONS

RUTHERFORD COUNTY
NORTH CAROLINA

FIGURE 2

DRAWN BY: PAUL DOW
PROJECT MANAGER: JIM MCELDUFF
CLIENT: RUTHERFORD COUNTY
DATE: 11/08/05

SCALE (FEET)
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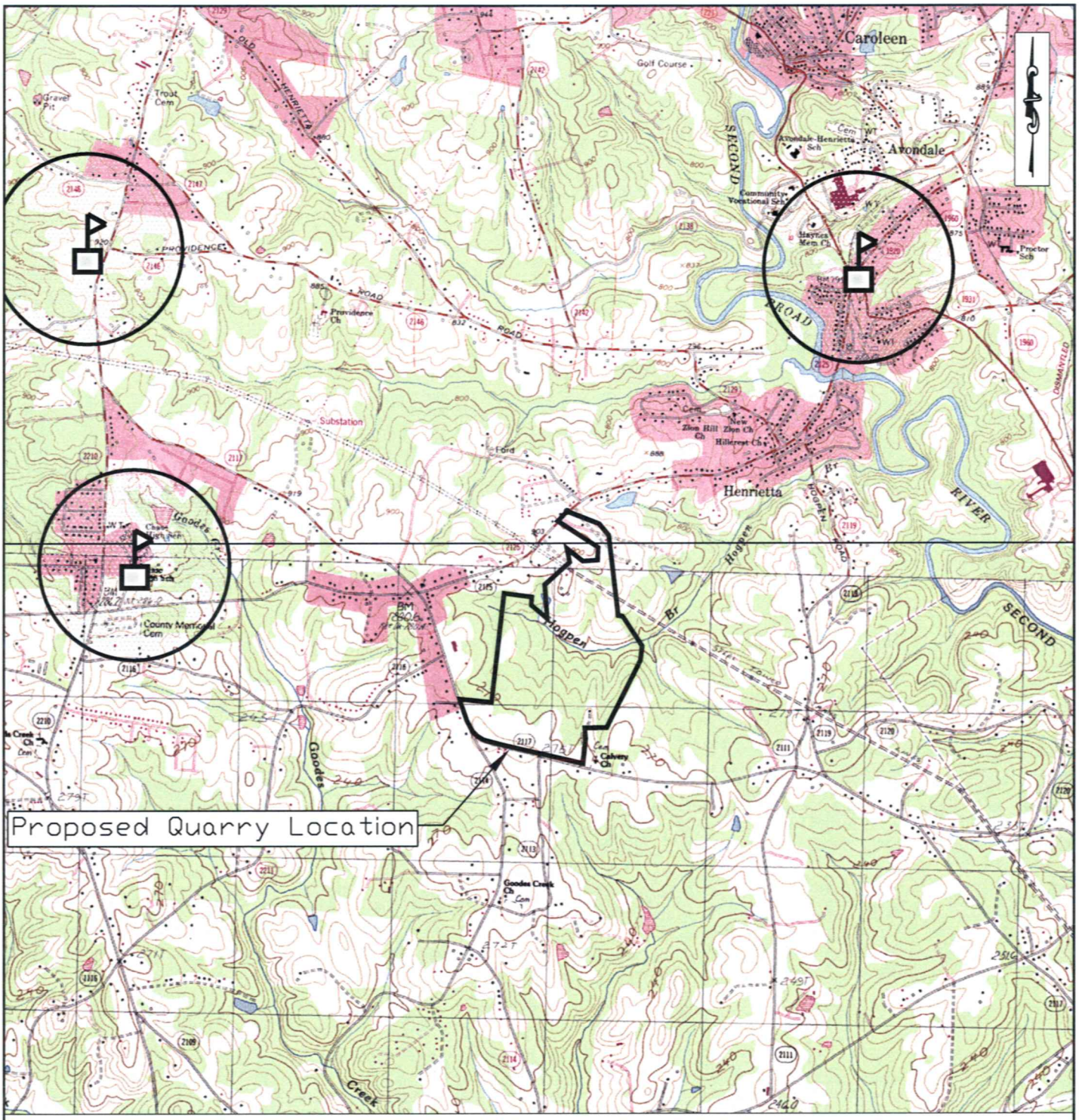

LEGEND

SCHOOL

USGS 35081-C7-TF-024 FOREST CITY 1993

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SCHOOL LOCATIONS WITH 2000 FOOT RADII

PROPOSED HENRIETTA QUARRY
RUTHERFORD COUNTY, NC

FIGURE 3

DRAWN BY: PAUL DOW
PROJECT MANAGER: JIM MCELDUFF
CLIENT: RUTHERFORD COUNTY
DATE: 11/08/05

SCALE (FEET)
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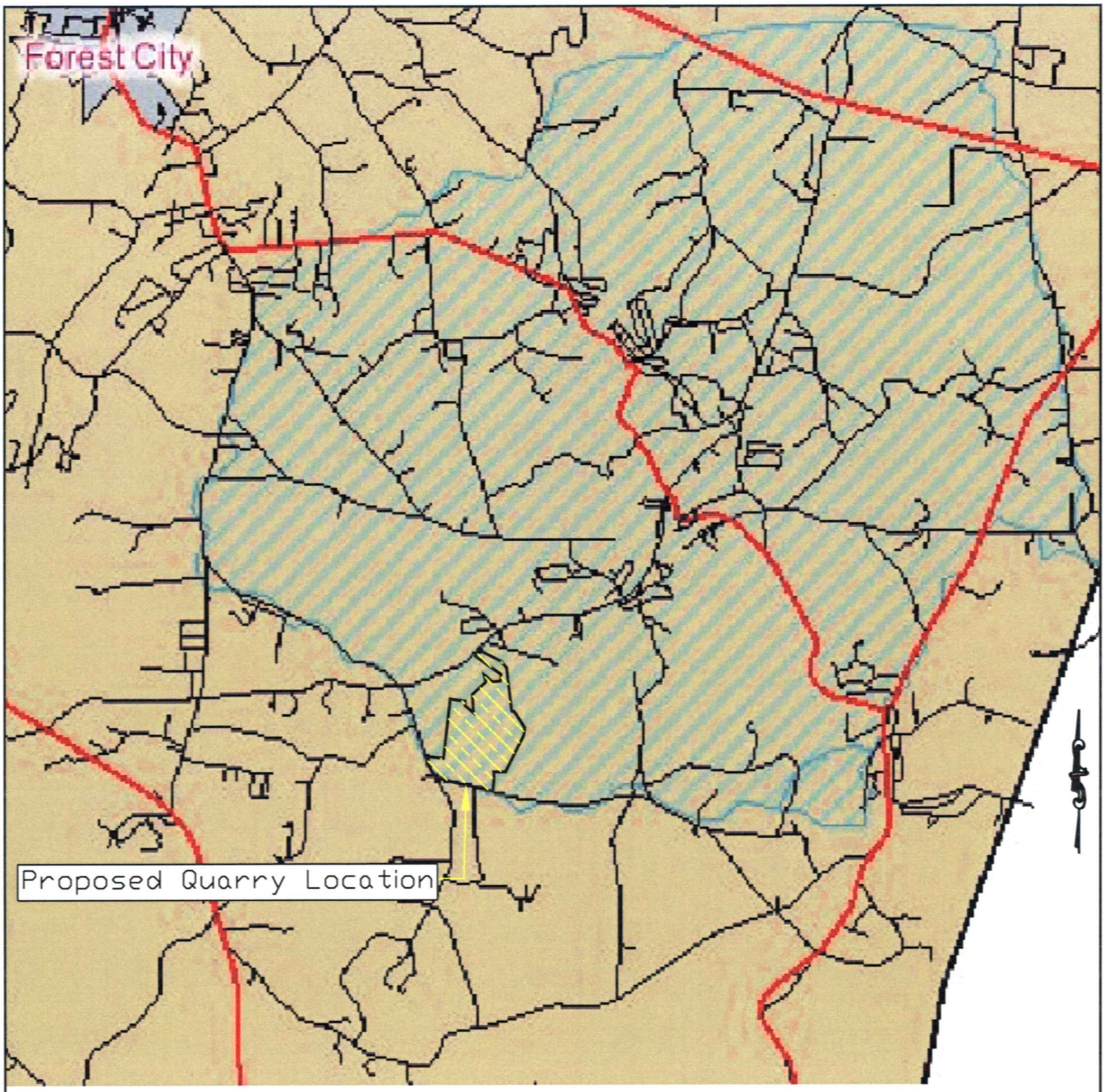
FILE PATH: P:\RUTHERFORD\FIGURES\CAD\HENRIETTA\ SCANNED.DWG



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Anderson & Associates http://www.andassoc.com

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WATERSHED AREA

PROPOSED HENRIETTA QUARRY
RUTHERFORD COUNTY, NC

FIGURE
4

DRAWN BY: PAUL DOW
PROJECT MANAGER: JIM MCELDUFF
CLIENT: RUTHERFORD COUNTY
DATE: 11/08/05

SCALE (FEET)
2500 0 2500 5000

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TABLES

Table 1
Air Quality Violations for APAC - Carolina, Inc.
Rutherford County, NC
November 9, 2005

County	Location	Date	Action	Agency	Comment
Transylvania	Penrose	3/10/1992	NOV	DNRCD - DEM	Excessive particulate emission from the bagfilter exhaust
		8/7/1995	NOV	DEHNR - AQ	Excessive particulate emission from the bagfilter exhaust
		10/7/1997	NOV	DEHNR - AQ	Excessive particulate emission from the bagfilter exhaust
		12/6/1999	NOV-NOIEA	NCDENR	Dust plumes of nearly 100% opacity from burner end of the drum, screen, weigh hopper, and aggregate dryer. Excessive particulate emission from the bagfilter exhaust
Henderson	Hendersonville	7/26/1982	NOV	DNRCD - DEM	Excessive particulate emission from the bagfilter exhaust
		12/13/1983	NOV	DNRCD - DEM	Excessive particulate emission from the bagfilter exhaust
		10/3/1985	NOV	DNRCD - DEM	Excessive particulate emission from the bagfilter exhaust
		11/23/1987	NOV	DNRCD - DEM	Excessive dust from the burner end of the rotary dryer
		9/15/1988	NOV	DNRCD - DEM	Excessive visible emission from the screen area on top of the plant
		5/29/1992	NOV	DEHNR - AQ	Simple cycle and baghouse malfunction resulting in substantial visibile emission observed from the exhaust stack
		5/18/1995	NOV	DEHNR - AQ	Visible dust emissions observed from baghouse exhaust stack
		7/1/1997	NOV	DEHNR - AQ	Visible dust emissions observed from baghouse exhaust stack
		10/16/1997	NOV	DEHNR - AQ	Visible dust emissions observed from baghouse exhaust stack - Follow-up on 7/1/97 NOV
		3/27/2002	NOV	NCDENR	Total Halogen Concentration in No. 4 fuel oil combusted in the drum dryer
		5/16/2002	NOORIMFC	NCDENR	Air Emissions resulted in objectionable odors
Yancey	Burnsville	8/30/1996	NOV	DEHNR - AQ	No method of dust control on the premises
		8/7/1996	NOV-NOIEA	DEHNR - AQ	No method of dust control on the premises
		6/10/1999	NOV-NOIEA	NCDENR	Excessive particulate emission from the bagfilter exhaust stack
Burke	Morganton	11/30/1998	NOV	NCDENR	Non submittal of emission testing
Rutherford	Rutherfordton	5/28/2003	NOV	NCDENR	Excessive particulate emission from the bagfilter exhaust

Notes:
1. NOV = Notice of Violation
2. NOIEA = Notice of Initiation of Enforcement Action
3. NOORIMFC = Notification of Objectionable Odors and Requirement to Implement Maximum Feasible Controls
4. The name of the air quality regulatory agency responsible for inspections has changed several times during plant operations.
5. DNRCD - DEM = Department of Natural Resources and Community Development - Division of Environmental Management
6. DEHNR - AQ = Department of Environment, Health, and Natural Resources - Air Quality
7. NCDENR = North Carolina Department of Environment and Natural Resources

Table 2
Industry Separation Ordinances
Rutherford County, NC
November 9, 2005

Location	Interview Notes	Industry Separation Requirements	Land Use Mechanism	Industry	Buffer Separation Distance (feet)	Zoning Minimum Facility Setback Distance (feet)	From	Structure or Property Line	Basis for Separation Distance
Alexander County, NC	Seth Harris - Planning and Development Dept. (10/27)	Yes	Zoning/Heavy Industrial	heavy industry	---	30	Side property line	NA	---
Alleghany County, NC	Amy Purdue - Planning and Recreation Dept. (10/28) (Obtained partial ordinance)	In process	Buffers	polluting industries including asphalt plants, cement mixing facilities, quarring, mining	2000 proposed	---	educational facility, a NC licensed child care facility, assisted living facility, nursing home, hospital, rural medical center, church, dwelling unit	Structure to structure	Patterned from Wilkes County ordinance; recommendations of county commissioners
Ashe County, NC	Planning Department (10/31) (Obtained partial ordinance)	Yes	Buffers	polluting industry	1320	---	school, daycare, hospital, nursing home facility	Structure to structure	Police Power ordinance; reasonableness clause
					1000	---	residential dwelling or commercial building	Structure to structure	
Avery County, NC	Nancy Cook- Clerk to Board (10/27)	No	NA	NA	NA	NA	NA	NA	NA
Buncombe County, NC	Zoning administrator Jim Coman (10/27)	No	NA	NA	NA	NA	NA	NA	NA
Burke County, NC	Marc Collins - Planning Director (10/31)	Yes	Zoning/R-MU district conditional uses	heavy industry including mines and quarries	NA	10	Side property line	NA	---
			scenic overlay districts	asphalt and concrete plants	Completely prohibited	NA	NA	NA	aesthetic considerations
Cabbarus County, NC	Roger Linz (11/02)	Yes	Zoning/General Industrial	asphalt and concrete plants	---	---	---	NA	---
			Zoning/General Industrial conditional use	quarries and sand pits	---	Established in conditional use permit	---	NA	---
Caldwell County, NC	Randy Feierabend - Planning Director (10/27)	Yes	Zoning/Industrial districts	heavy industry	---	25	Side property line	NA	---
Catawba County, NC	Planning Development Dept. (10/28)	Yes	Zoning/Industrial districts	heavy industry	---	25	Side property line	NA	---
Cleveland County, NC	Chris Martin - Planning/Mapping Department	Yes	Zoning/Industrial districts	heavy industry	---	10	Side property line	NA	---

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Location	Interview Notes	Industry Separation Requirements	Land Use Mechanism	Industry	Buffer Separation Distance (feet)	Zoning Minimum Facility Setback Distance (feet)	From	Structure or Property Line	Basis for Separation Distance
Davidson County, NC	John Mendenhall - Planning and Zoning Department (10/28) (Obtained partial ordinance)	Yes	Zoning/Heavy Industrial	heavy industry including asphalt and concrete plants	---	20	Side property line	NA	---
			Special Use Permits	quarries	---	20	Side property line	NA	---
Davie County, NC	Andrew Meadwell (10/31)	Yes	Zoning/Special Use Permit	heavy industry including asphalt plants, concrete plants, quarries and sand pits	---	100	Side property line	NA	Setbacks, where required were modeled after those in similar jurisdictions
Forsyth County, NC	(Obtained partial ordinance)	Yes	Buffers	asphalt and concrete plants	500	---	school, library, church, or certain property zones	Structure to property	Survey of other NC jurisdictions
Hillsborough, NC	Margaret Hauth - Planning Director (10/27) (Obtained partial ordinance)	Yes	Prohibited	asphalt plants	Completely prohibited	NA	NA	NA	NA
Iredell County, NC	Rebecca Harper (Obtained partial ordinance)	Yes	Buffers	heavy industry including asphalt plants, concrete plants, quarries and sand pits	---	10	Side property line	NA	---
Jackson County, NC	(Obtained partial ordinance)	Yes	Buffers	asphalt plants	1320	---	commercial use, school, child care home, child care instituition, day care center, church, hospital, nursing care home, nursing care instituition	Property to property	Baghouse studies, county circumstances, larger distances prohibitive
Lenoir, NC	Chuck Beatty - Town Planner (10/27)	Yes	Zoning/Industrial districts	heavy industry	---	---	---	---	---
Lincoln County, NC	Randy Hawkins - Zoning and Code Enforcement (10/27)	Yes	Zoning / Special Use Permits	General industry/ Special Use Permits required for high impact industries	---	---	---	---	---
Macon County, NC	Stacey J. Guffey - Planning Director (10/26) (Obtained partial ordinance)	Yes	Buffers	asphalt plants	1000	---	commercial use, school, child care home, child care instituition, day care center, church, hospital, nursing care home, nursing care instituition	Structure to structure	Modeled after ordinances from other locales; considered public input
				concrete suppliers	1000	---			

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Industry Separation Ordinances
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November 9, 2005

Location	Interview Notes	Industry Separation Requirements	Land Use Mechanism	Industry	Buffer Separation Distance (feet)	Zoning Minimum Facility Setback Distance (feet)	From	Structure or Property Line	Basis for Separation Distance
McDowell County, NC	Ron Harmon - Planning Dept (Obtained partial ordinance)	Limited	Voluntary zoning	---	---	50	Front property line	NA	NA
Mitchell County, NC	Clerk to the Board of Commissioners (10/27)	No	NA	NA	NA	NA	NA	NA	NA
Polk County, NC	Anne Britton - Clerk to Board (10/27)	No	NA	NA	NA	NA	NA	NA	NA
Randolph County, NC	Tim Mangum - Dept. of Planning and Zoning (10/28)	Yes	Zoning/Heavy Industrial	heavy industry	---	30	Front property line	NA	---
Richmond County, NC	James Armstrong - Planning Department (10/28)	Yes	Zoning/ Heavy Industrial	heavy industry	---	15	Side property line	NA	---
Rockingham County, NC	Lucas Carter - Planning and Inspections Dept. (10/28)	Yes	Zoning/Heavy Industrial	heavy industry	---	---	---	---	---
Rowan County, NC	Shane Stewart - Planning Dept. (10/27)	Yes	Buffers	asphalt plants	2640	---	church, licensed daycare, public or private school, health care facility, public park or existing inhabited dwelling	Structure to property	Modeled after other ordinances
				concrete plants	2640	---			
				quarries	500	---	residence		
Rutherford County, NC	Danny Searcy - County Planner	Yes	Buffers	Certain industries including: asphalt plants, concrete plants, quarrying, sand pits	2000	---	school	Structure to property	Modeled after other ordinances
Stokes County, NC	David Sudderth (10/31)	Yes	Zoning/ Conditional Uses/Noise nuisance ordinance	asphalt plants, concrete plants, quarries, and sand pits	---	15	Side property line	NA	---
Surry County, NC	Adrienne Dollyhigh	Yes	Zoning/ Conditional Use Permits can require additional setbacks	Manufacturing and Industrial	---	25	Side property line	NA	---
Transylvania County, NC	Mike Thomas - County Planner	No	NA	NA	NA	NA	NA	NA	NA

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Rutherford County, NC
November 9, 2005

Location	Interview Notes	Industry Separation Requirements	Land Use Mechanism	Industry	Buffer Separation Distance (feet)	Zoning Minimum Facility Setback Distance (feet)	From	Structure or Property Line	Basis for Separation Distance
Watauga County, NC	Joe Furman - Planning Department (10/27)	Yes	Buffers	high impact land uses including: asphalt plants	1500	---	public or private educational facility, a NC licensed child care facility, a NC licensed assisted living facility, a NC licensed nursing home	Structure to property	Negotiation within planning committee
Wilkes County, NC[1]	E. Barnes - Planning Department	Yes	Buffers	high impact land uses including: asphalt plants, cement manufacturing facilities	1000	---	residence, business, or other utilized structure	Structure to structure	Modeled after Watauga County ordinance
Yadkin County, NC	Kim Bates	Yes	Zoning/ Set-backs	asphalt plants and concrete plants	---	200	residential	Structure to structure	Practical data used; Modeled after Surry County ordinance
Yancey County, NC[1]		No	NA	NA	NA	NA	NA	NA	NA
Babylon, NY	Laura Feitner - Engineering Department and Joe Guarino - Environmental Department (10/26/05) (Obtained partial ordinance)	Yes	Zoning and buffers	asphalt plants	2000	---	churches, schools, libraries, hospitals, assisted living and long term care facilities, and park and recreation areas	Property to property	Setbacks set according to existing locations of HMAs
					1500	---	residentially zoned property		
					750	---	residential uses in non-residential zone		
Thurston, WA	Jennifer Hayes - Mineral Lands Task Force	In Process	Zoning and buffers	asphalt plants	Not determined	---	---	---	Attempted to determine buffers from scientific studies inconclusive

Notes:
1) Compiled by Danny Searcy, Rutherford County Planner
2) NA: Not applicable

Table 3
Riparian Buffers
Rutherford County, NC
November 9, 2005

Source	Function	Vegetation	Buffer Width (ft)
Ashe County, NC	Watershed protection	Vegetated	30 (Low density development)
			100 (High density development)
Buncombe County, NC	Watershed protection	Vegetated	30 (Low density development)
			100 (High density development)
Carl Vinson Institute of Government	Water Quality Protection (3 options)	Forested	100 + 2 per 1% slope
		Forested	50 + 2 per 1% slope + wetlands
		Forested	100 fixed width
Chester County, SC	Natural resource protection of Catawba and Broad Rivers	Vegetated	100
City of Alpharetta, GA	Erosion and sedimentation control	Vegetated	100
Environmental Defense in collaboration with Cape Fear River Watch, Clean Water for North Carolina, Neuse River Foundation, North Carolina Watershed Coalition	Sediment removal	Grass	30 to 50
	Nitrogen Removal	Forested	50 to 100
	Phosphorus Removal	Grass	30 to 100
	Water quantity	Forested or grass	All of flood plain
	Temperature moderation	Forested	33 minimum
	Pesticide Removal	Forested or grass	50 minimum
	Water quality protection	Forested	30 Zone A
		Forested or grass	20 Zone B
Forsyth County, NC	Watershed protection	No development	100
Lancaster County, PA	Water quality protection (Steam Order 1-2)	Forested	35
	Water quality protection (Steam Order 3-4)	Forested	50
	Water quality protection (Steam Order >4)	Forested	75
Rutherford County, NC	Watershed protection	Vegetated	30 (Low density development)
			100 (High density development)
Triangle J Council of Governments	Stabilize stream bank	Undisturbed forest	3 zones
	Pollutant Removal	Managed Forest	
	Sediment Removal	Grass (In Piedmont)	
Stormwater Center	Protect Stream Integrity	Mature forest	100 minimum (3 zones)
	Development separation	Managed Forest	
	Filter runoff	Forested or grass	